MONTHLY WEATHER REVIEW.

DECEMBER, 1894.

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INTRODUCTION.

The REVIEW for December, 1894, is based on reports from 3,318 stations occupied by regular and voluntary observers. These reports are classified as follows: 151 reports from Weather Bureau stations; 35 reports from U. S. Army post surgeons; 2,313 monthly reports from State Weather Service and voluntary observers; 32 reports from Canadian stations; 217 reports through the Southern Pacific Railway Company; 546 marine reports through the cooperation of the Hydrographic Office, Navy Department, and "New York Herald Weather Service;" monthly reports from 24 U. S. Life-Saving stations; monthly reports from local services established in all States and Territories; and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

The WEATHER REVIEW for this month has been prepared under the general editorial supervision of Prof. Cleveland Abbe. Unless otherwise specifically noted, the text is written by the Editor, but the statistical tables are furnished by the Division of Records and Meteorological Data, in charge of Mr. A. J. Henry, acting chief of that division.

CHARACTERISTICS OF THE WEATHER FOR DECEMBER, 1894.

The most interesting meteorological features of December were the persistent ridge of high pressure over the Rocky Mountain plateau; the heavy rain on the coast of California, Oregon, and Washington; the unprecedented snowfall on the Sierra and Coast ranges; the great cold wave and freeze that extended over Florida on the 28th and 29th; the severe storm of the 27th on the middle Atlantic and New England coasts.

ATMOSPHERIC PRESSURE.

[*In inches and hundredths.*]

The distribution of mean atmospheric pressure reduced to sea level, as shown by mercurial barometers not reduced to standard gravity and as determined from observations taken daily at 8 a. m. and 8 p. m. (seventy-fifth meridian time), during December, 1894, is shown by isobars on Chart II. That portion of the reduction to standard gravity that depends on latitude is shown by the numbers printed on the right-hand border. This Chart also gives the so-called resultant wind directions for this month, based on the data given in Table IX of this REVIEW.

During the current month of December the highest mean pressures were: 30.32, Idaho Falls; 30.31, Laramie; 30.29, Cheyenne; 30.27, Salt Lake City; 30.26, Denver; 30.25, North Platte.

The lowest mean pressures were: 29.90, Fort Canby; 29.91, Tatoosh Island; 29.94, Port Angeles; 29.96, Seattle; 29.98, Roseburg; 29.99, Marquette. To the northward of this region the lowest pressures at Canadian stations were: 29.98, at Calgary and Port Arthur.

The normal distribution of atmospheric pressure and normal resultant wind direction for the month of December were approximately shown on Chart V of the REVIEW for December, 1893, as computed by Prof. H. A. Hazen, and are not now reproduced. As compared with the normal for December, the mean pressure for the current month was decidedly in excess in New England, Nova Scotia, and Newfoundland, and also in Wyoming, Colorado, and Texas.

The principal excesses were: Sydney, 0.16; St. Johns, 0.15; Halifax and Cheyenne, 0.12; Eastport, 0.10. Pressures were deficient from the western part of Lake Superior along the northern part of the United States as far as the Pacific Ocean and along the coast of Washington and Oregon as far south as Los Angeles, the maximum deficits being: 0.14, Roseburg and Calgary; 0.09, Eureka, and 0.08, Medicine Hat.

As compared with the preceding month of November, the pressures reduced to sea level show a rise in the northeastern and eastern portions of the United States from Maine to North Carolina, the Lake region, the Lower Mississippi Valley, and Northwest. The large rises were: Sydney, 0.15; St. Johns, 0.14; Chatham, Father Point, and Halifax, 0.12; Quebec, 0.11; Eastport, 0.10. The large falls were: Fort Canby, 0.23; Tatoosh Island, 0.21; Portland, Oreg., Roseburg, and Port Angeles, 0.18; Seattle and Eureka, 0.17; Carson City, 0.10.

DIURNAL VARIATIONS.

The systematic periodic diurnal variations of pressure are shown by the hourly means given in Table VI.

AREAS OF HIGH AND LOW PRESSURE.

The following sections give some details as to the phenomena attending the individual areas of high and low pressure. Hitherto it has been customary to enumerate the storm wind signals in connection with special areas of low pressure. During the summer months high winds occur in connection with

areas of low pressure, or so-called storm centers, but during the winter season the northwesterly gales are by reason of their coldness associated with the areas of high pressure. In general, it is proper to consider a strong wind in connection with steep barometric gradients and to postpone any decision as to whether the low pressure on one side, or the high pressure on the other, is especially responsible for the gradient or the wind. As the ordering of wind signals oftentimes depends quite as much on the approach of a high area as of a low the Editor will, for the present, publish these signal orders in connection with the chapter on "High winds," where the connection between the high and low areas will also be mentioned when necessary.

HIGH AREAS.

The principal characteristic of the areas of high pressure during December was the general persistency of their movements southeastward over the Rocky Mountain region into the Gulf States, and thence eastward into the Atlantic Ocean. Only two areas, Nos. IV and IX, passed eastward over New England. On the northeast and southwest sides of the principal paths of high pressure, the low areas have developed, as usual, either in the British Possessions on the north or on the Pacific Coast to the southwest of California.

I.—This was a continuation of high No. XIV of the series for November, and disappeared on the 2d off the south Atlantic coast.

II.—This appeared on the 1st, a. m., in Alberta, and prevailed until the 4th, p. m., over the Rocky Mountain plateau and eastern slope, after which it disappeared in the south Atlantic States.

III.—This was essentially a subdivision of No. II over the Rocky Mountain region, and III*a* was a further subdivision or specialization of the same area, which at that time prevailed from Idaho to North Carolina, while an extensive depression, low No. III, developed in British Columbia, and southerly winds, with rain, prevailed throughout the Pacific States.

IV.—This represented the rising barometer between low areas Nos. II and III; it prevailed over Ontario, northern New England, and Nova Scotia, and was best developed on the 10th, 11th, and 12th, after which it disappeared south of Newfoundland.

V.—On the 7th, a. m., pressure began rising in southern California and the tropical high pressure on the Pacific Ocean pushed northeastward over Arizona and New Mexico, maintaining high pressure in those regions until the 9th, after which it extended northward, and by the 11th, a. m., was central in Utah. This area then broke up into two portions, V*a* and V*b*, and by joining with the following area, VI, became lost in a general ridge of high pressure.

VI.—On the 11th, p. m., an area of high pressure was rapidly approaching Oregon and northern California, and by the 12th, p. m., a ridge of high pressure prevailed from that region southeast to Alabama, while low No. VIII developed on the southwest side, and low No. IX in Alberta. After the 12th two centers, Nos. VI*a* in the west and VI*b* in the east can be distinguished, as this extensive ridge of high pressure divided into two portions, and low No. IX stretched southward between them.

VII.—On the 18th, a. m., the ridge of high pressure from British Columbia to Wyoming began again to increase, while low No. XII to the northward also deepened. During the 18th and 19th this high pressure moved southeastward until the entire Gulf and south Atlantic States were under its influence. During the 20th and 21st it stretched northeast over the Atlantic Coast States, after which it disappeared.

VIII.—This was a small region of high pressure that passed southeastward over Wyoming on the 21st, p. m.

IX.—This was a rather larger area of high pressure that pursued a southeasterly movement from Alberta on the 20th, reaching Nova Scotia on the 24th, and the greater part of its area lay on the northern border of the Daily Weather Map.

X.—On the 22d, p. m., pressure was rising over California, Nevada, and Oregon, and the tropical high pressure rapidly encroached upon the Pacific States. By the 23d, p. m., pressure was highest in Oregon, and by the 24th, a. m., in British Columbia, after which the northward movement of this center ceased and a southward movement began, represented by two areas, X*a* and X*b*. Of these X*a* represents a small region or subordinate center that moved eastward into Manitoba, and disappeared on the 25th, but X*b* represents the principal center which, on the 26th, p. m., was central in Saskatchewan, whence it moved rapidly south, reaching Texas by the 28th, a. m., and thence eastward, reaching Alabama on the 29th, p. m. The central highest pressures, reduced to sea level, were: 25th, a. m., 30.84, temperature —10, Winnemucca. 25th, p. m., 30.76, temperature 8, Winnemucca. 26th, a. m., 31.08, temperature —10, Battleford. 26th, p. m., 31.26, temperature —22, Qu'Appelle. 27th, a. m., 31.14, temperature —16, Qu'Appelle; also 31.14, temperature —24, Bismarck. 27th, p. m., 31.10, temperature —6, Cheyenne. 28th, a. m., 31.00, temperature 6, Abilene. 28th, p. m., 30.82, temperature 32, San Antonio. 29th, a. m., 30.76, temperature 16, Mobile. 29th, p. m., 30.60, temperature 32, Mobile. 30th, a. m., 30.54, temperature 22, Jacksonville. On this latter date the ridge of high pressure, 30.10 or more, extended from British Columbia eastward over Manitoba, southeast to Pennsylvania, and southward over the main portion of the United States. The freezing temperatures that were thus brought to Florida were among the severest on record and are described in another portion of this REVIEW. The Crop Bulletin for the month ending December 31, 1894, states that "the night of Friday, the 28th, was one of the coldest known in the south Atlantic and Gulf States, and in Florida the temperature was about 5° below any previously recorded. Among the minimum temperatures were: Charlotte, 2; Atlanta, 4; Jacksonville, 14; Mobile, 16; Tampa, 18; Jupiter, 24. The following warnings were issued by the Weather Bureau on the morning of the 28th:

Observer, Jupiter, Fla.: Frosts to-night, with temperature about freezing.

Observers, Tampa and Jacksonville, Fla.: Frosts to-night; temperature will fall about 25° in northern portion.

Observer, Jacksonville, and President of the Southern Florida Railroad, Sanford, Fla.: Temperature will fall 16° to 20° by Saturday.

Observer, Jacksonville, Fla.: Fair; colder, with frosts to-night. Western Florida: fair; cold wave.

LOW AREAS.

I.—This was an ill-defined depression in Texas on the 1st, a. m. It then extended northeastward as a narrow trough, over which light rain prevailed, and by the 2d, a. m., the area of slight depression covered the middle Atlantic States and lower Lake region. After this it developed into a well-marked storm that was, on the 3d, a. m., central in Nova Scotia and southern Newfoundland.

II.—This appeared in Alberta on the 3d, p. m., moved eastward along the northern border of our stations, and disappeared east of Newfoundland on the 7th, a. m.

III.—This appeared on the 5th, a. m., in British Columbia; the center moved east into Manitoba, while the depression stretched southeast over the entire Rocky Mountain region. On the 7th, a. m., low No. III was central in North Dakota, while another depression, low No. IV, was near the coast of Oregon. Evidently both of these depressions belonged to an extensive meiobar, reaching from the central portion of the United States northwest to the general meiobar of Alaska, the Aleutian Islands, and Bering Sea. No. III moved eastward over the Lake region and disappeared on the 9th.

IV.—This extensive depression developed rapidly on the 7th off the coast of Oregon, and apparently moved northward

into British Columbia, where it disappeared on the 8th; but on the 9th, a. m., a very similar depression, low No. V, suddenly appeared on the coast of Washington, and, moving northward, similarly disappeared in British Columbia. These areas were accompanied by heavy gales throughout the Pacific States, as also by rain in the lowlands and snow in the highlands. The daily weather map necessarily shows only the south and east portion of the system of winds and pressures. It is plausible and even probable that a first hurricane had moved centrally toward the east-northeast, reaching Washington on the 7th, p. m., and a second on the 9th, a. m.; but as both of these systems of hurricane winds were essentially confined to the lower atmosphere they were soon broken up by the resistances offered by the Rocky Mountains and coast ranges, so that on the following days only a slight and irregular depression appeared in the interior of British Columbia.

V.—On the 9th, a. m., a low area, entirely similar to No. IV, again suddenly appeared on the coast of British Columbia, where it broke up on the same date, so that on the 10th, a. m., only an indefinite depression appeared in Alberta. Both areas, IV and V, must be considered as temporary incidents in the flow of air from the pleiobar off the Pacific coast into the meiobar that prevailed in the interior of North America.

VI and VII.—A depression began to be well-defined on the 9th, a. m., in Texas and represented the southern extremity of the general depression over the interior of the continent. It moved northeastward, dividing into two portions, VI and VII, which were, however, again united on the 12th, and disappeared on the 14th, a. m., over Newfoundland. Severe gales attended its passage over the Lake region on the 11th and 12th.

VIII.—This was an indefinite depression that approached Arizona on the 12th and that prevailed over southern California on the 13th. Nothing more is known of the history of its movements, but the prevalence of high area No. VI, which was at this time central over the Rocky Mountain plateau region, implies that a very considerable depression must have been moving northward off the coast of Lower California. It is during such distributions of pressure as occurred at this time that the dry, northeasterly winds surmount the Mexican plateau and descending upon the Pacific coast of that country produce local storms similar to the "Papagayos" of the Nicaragua coast; some account of these is given by a special correspondent, Mr. G. O. Rogers, in another part of this REVIEW.

IX.—This appeared on the 12th, p. m., in Alberta as one of the numerous special depressions on the northeast side of the general belt of high pressure; it may also be considered as one of the numerous minor whirls that reach down from the upper atmosphere to the earth's surface in the course of their movement around the great polar meiobar. This depression moved southeastward, reaching Iowa on the 15th, and then turned rapidly northeastward over the Lake region, disappeared on the 18th beyond the Gulf of St. Lawrence.

X.—On the 16th, a. m., this low area approached Vancouver Island, but on the 17th had broken up like its predecessors, Nos. VI and VII.

XI.—This appeared on the 17th, a. m., off the coast of Oregon and disappeared in the same region on the 18th. Both X and XI may be regarded as depressions that had a mechanical origin between opposing air currents and that soon died out, because the direction of the whirl, the dryness of the inflowing air, and the deflection due to the Pacific coast mountains all united to oppose any further development.

XII.—This appeared on the 19th, p. m., in Alberta, but can hardly be considered as a continuation of the history of No. XI, although an indefinite area of low pressure evidently extended from the Pacific across British Columbia into the interior of the continent. This area may be traced southward and eastward, passing over the Lake region on the 21st and disappearing south of Newfoundland on the 23d, a. m. High winds prevailed in the Lake region on the 21st and 22d, but with very little rain or snow.

XIII.—Appeared on the 21st, p. m., off the coast of Oregon, and by the 22d, p. m., was apparent only as a slight trough, extending northwest and southeast from British Columbia to South Dakota; in fact, the original depression would be considered as having entirely disappeared were it not believed that such troughs of pressure reduced to sea level often represent merely the trail of a very rapid-moving depression in the upper atmosphere, such that the front of the trough is pushing forward faster than the rear can fill up; this appearance may also be explained as the movement of the locus of interference of the troughs of two waves. On the 23d, p. m., this depression was central in Minnesota, with a steadily falling central pressure. On the 24th, as it passed eastward over the northern portion of the Lake region, the winds and the precipitation increased. By the 25th, p. m., it was central over the Gulf of St. Lawrence, after which it disappeared.

XIV.—High pressure and cold, fair weather now prevailed for several days over the Rocky Mountain plateau, the Mississippi Valley, and Gulf States, but on the 25th, p. m., a cyclonic whirl developed in eastern Texas, on the southern border of the region of cold, northerly winds. This is apparently a case of a whirl that was initiated by the simple confluence of northerly and southerly winds, but the direction of the whirl, the temperature of the northerly and the moisture of the southerly winds conspired to feed and develop the cyclonic whirl, and it rapidly increased in area and intensity. On the 26th, p. m., it was central in South Carolina, and the area of snow or cloud extended northward to Massachusetts, Upper Michigan, and eastern Wisconsin. A severe norther prevailed on the Texas coast and northeast gales on the Atlantic coast. By the 27th, a. m., the lowest pressure (29.26) was central between Philadelphia and Atlantic City, and gales prevailed over the Lower Lakes, the Middle and Eastern States. By the 27th, p. m., the lowest pressure was central in northern Maine, and storm winds from 38 to 64 miles prevailed on the Lower Lakes, St. Lawrence Valley, the Middle States, and New England, but the oval contour of the isobars showed the influence of the land and mountains in breaking up the symmetrical circular whirl that had existed on the 27th, a. m. The great development of this storm on the 27th contributed somewhat to the southward flow of cold air which culminated in Florida on the 29th.

The growth of such storms as this depends much upon the amount and location of the snowfall, as is seen from a study of the detailed reports such as the following:

Cincinnati, Ohio.—26th, light, spitting snow began at 12.30 p. m., which gradually turned to heavy, driving, northeast snowstorm. A steady snowfall during the afternoon and continuing into the night. The snow was of a packing character, interrupting traffic and travel. Snowfall up to 8 p. m., 3 inches.

Buffalo, N. Y.—27th, the first real snowstorm set in at about 9 o'clock last night, and still continues. High winds. Thermometer, 18° above zero.

Utica, N. Y.—27th, worst storm for the season within the memory of the oldest inhabitant.

Philadelphia, Pa.—26th, sky filled with thin clouds soon after sunrise and cloudiness increased rapidly, obscuring all sunshine before noon, and sky became very heavy and threatening as the afternoon wore on. The barometer began to fall about noon, and fell with extreme rapidity from 4 p. m., at which hour a furious northeast snowstorm set in. Snow changed to heavy sleet at 8.30 p. m., and sleet changed to rain at 11.50 p. m. About 2.8 inches of snow and sleet fell before the change. About 1.7 inches of snow fell up to 8 p. m., and amount of precipitation had to be estimated at 8 p. m. observation on account of incorrectness of snow-gauge reading due to high wind. 27th, the storm continued all last night, the rain freezing to everything it touched during the early hours and heavily coating with ice telegraph, telephone, and electric-light wires. Immense damage was done to all these poles and wires. No evidence of tornado winds was observable. The weather continued to moderate until this morning, and rain ended at 7.10 a. m. The barometer reached its lowest (29.25) at 8 a. m., making the remarkable fall of 1.15 inches in 20 hours. At 8.20 a. m. it began to rise, being quite as rapid as the fall, and

amounting to 0.82 in the 12 hours ending 8 p. m. The anemometer cups were stopped by ice from 2 to 3.15 a. m., thus interrupting the record.

Atlantic City, N. J.—27th, a storm area nearly central at 8 a. m., with a pressure of 29.26 inches; cloudy nearly all day; high westerly winds; maximum velocity of wind, 47 miles southwest; rain commenced at 8.50 a. m., ending about 9.22 a. m.; snow flurry from 11.28 to 11.40 a. m., and from 3 to 3.14 p. m.; amount of snowfall, trace. All telegraph wires leading from Atlantic City are down, with the exception of one belonging to the Reading Railroad; a. m. weather reports sent by this line 10.20 a. m.; p. m. report delayed, due to wire trouble; a. m. forecast received from Philadelphia at 5.10 p. m., by mail. The tracks of the Pennsylvania Railroad during night and forenoon were covered by high tides; all trains late. The storm has been very severe on telegraph lines.

New York, N. Y.—26th, snow began 5.18 p. m. and ended 11.15 p. m.; sleet began 11 p. m. and continued over midnight. High northeast winds at night. Total snowfall to midnight, 4 inches. 27th, the sleet ended 5.40 a. m.; rain began 5.40 a. m. and ended 12 noon; snow began 12 noon and ended 1.35 p. m. High northeast to northwest winds. Several small sloops reported driven ashore on Long Island and Staten Island coasts. Snowfall to midnight, 4.2 inches.

New Haven, Conn.—27th, the snow which began yesterday, at 7 a. m., changed to sleet during the night, and this continued until 11 a. m. to-day. It was the severest storm of the season. Although the precipitation was not remarkably heavy, the very high wind movement made the storm destructive. Travel on the street railways was carried on only with difficulty. Wind rose to 41 northeast at 5.50 a. m. By dark it had become clear, and after that it became cold, with light wind.

Block Island, R. I.—26th, a storm from the east began 7.05 p. m., and continued. 27th, snow began at 1 a. m. and turned to rain during night. Storm prevailed during the night, accompanied by heavy rain, and ended 5.30 p. m.; maximum velocity, 68 miles per hour, at 2.15 a. m.

Vineyard Haven, Mass.—Violent easterly gale last night; changed to westerly to-day; blowing heavily.

Provincetown, Mass.—27th, a heavy gale, accompanied by a blinding snowstorm, set in last night. At 4 this morning wind hauled to the southeast, and rain fell in torrents.

Boston, Mass.—27th, the wind increased during the night and continued high through the day, shifting from northeast to north, northwest, west, southwest, and south, and back again to southwest and west. It blew in gales from 40 to 50 miles, the latter occurring at 9 a. m., from the northeast. The high wind, with the snow, sleet, and rain, has made this one of the severest storms of the season. Considerable damage resulted from the storm in the vicinity of the station; it was greatest in South Boston, where a church and school building were partly unroofed. Numerous electric and telegraph poles were blown down, wrecking wires and delaying business in many ways. Railroad traffic was much delayed by the drifting snow, falling poles, and wires. No damage to shipping in this vicinity, so far as known at this office.

Lowell, Mass.—Twelve to fourteen inches of snow fell last night; then it changed to hail.

Plymouth, N. H.—27th, first bad storm of the season occurred to-day. Six to twelve inches of snow fell, accompanied by strong east winds.

Nashua, N. H.—Storm to-day the worst of the winter. Twelve inches of snow have fallen, and business is partially suspended.

Portsmouth, N. H.—A severe northeast snowstorm commenced last night and continued up to noon to-day. Railroad trains are delayed from one to two hours, and business is generally suspended on account of the almost impassable condition of the streets. A heavy storm raging at sea, the wind reported as blowing 70 miles an hour.

Concord, N. H.—The snowstorm and gale are very severe. Snow nearly a foot deep, and the snowfall has been succeeded by a fine hail. Temperature from 10° to 20° above zero.

Manchester, N. H.—27th, storm reached here last night at 9.30, and has increased hourly since. Snow about a foot deep, and a fierce, cutting hailstorm now prevails.

Bangor, Me.—27th, a northeast gale and snowstorm reached here early this morning. Snowfall was heavy, and the wind drifted the snow badly. Temperature ranges from 10° to 15° above zero.

Lewiston, Me.—The snowfall was about 10 inches. Temperature about 11° above zero.

Biddeford, Me.—27th, the storm caused a general suspension of business.

Portland, Me.—27th, the storm that commenced last night, at 10 p. m., continued to rage all the morning. The wind reached a velocity of 36 miles at 6.35 a. m. Snow turned to sleet at 10 a. m.; sleet ended at 1.35 p. m. Cloudy weather, with high northeast backing to southwesterly and occasionally to south winds. Amount of snow unmelted, 8.2.

Eastport, Me.—27th, gale began 1.15 a. m.; height, 60 northeast, at 10.10 a. m., and ended 7.30 p. m. Rapidly falling barometer and rising temperature. The storm while it lasted was very severe.

XV.—This was an ill-defined depression moving northward along the coast of California during the 26th, 27th, and 28th, and its existence is, to some extent, inferred from the presence of the remarkable high area which was then central on the eastern slope of the Rocky Mountains.

XVI.—This apparently developed on the 28th off the south Atlantic coast by the flow of cold northerly air southeastward over the Gulf Stream; it moved rapidly northward, and by the 29th, a. m., was central near Nova Scotia, and disappeared on the 29th, p. m., over Newfoundland. Northwesterly gales prevailed along our Atlantic coast, and the center of the storm passed northward between Cape Hatteras and Bermuda.

XVII.—On the 28th, p. m., an area of low pressure moving southeastward approached Lake Superior; it moved slowly eastward, developing somewhat on the 29th, but disappeared on the 30th north of the St. Lawrence.

XVIII.—This depression pursued a path similar to the preceding, moving southeastward toward Lake Superior, where it was central on the 31st, p. m.

MOVEMENTS OF CENTERS.

The following table shows the date and location of the center at the beginning and ending of each area of high or low pressure that has appeared on the U. S. Weather Maps during the month, together with the average daily and hourly velocities. The monthly averages will differ according as we consider each path as a distinct unit, or give equal weight to each day of observation; in the first case the monthly average is taken by paths, in the latter case by days.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	1, a. m.	34	83	2, p. m.	32	80	350	1·5	233	9·7
II	1, a. m.	52	109	4, p. m.	43	112	1,600	3·0	533	22·2
III	2, a. m.	47	113	4, p. m.	32	102	1,400	2·5	560	33·3
IIIa	4, a. m.	33	102	8, p. m.	29	79	2,150	4·5	478	19·9
IV	6, a. m.	50	85	12, a. m.	45	62	1,900	6·0	317	13·2
V	7, a. m.	35	119	11, a. m.	40	108	2,400	4·5	533	26·4
Va	11, a. m.	34	108	11, p. m.	42	109	150	0·5	.....	.....
Vb	11, a. m.	34	108	11, p. m.	34	103	500	0·5	.....	.....
VI	11, p. m.	42	125	12, p. m.	43	104	1,200	1·0	1,200	50·0
VIa	12, p. m.	43	104	16, p. m.	32	80	2,500	4·0	625	26·0
VIb	12, p. m.	43	104	20, a. m.	43	65	5,200	7·5	693	28·9
VII	18, a. m.	46	115	21, p. m.	32	89	2,800	2·5	1,120	46·7
VIII	20, p. m.	43	111	21, p. m.	30	104	550	1·0	550	22·9
IX	20, p. m.	54	112	24, p. m.	44	64	2,550	4·0	638	26·6
X	22, p. m.	37	122	24, a. m.	53	119	1,350	1·5	900	37·4
Xa	24, a. m.	53	119	25, p. m.	45	112	1,050	1·5	700	29·2
Xb	24, a. m.	53	119	30, p. m.	30	80	3,900	6·5	600	25·0
Sums	.....	.....	.....	.....	.....	.....	31,550	53·5	9,680	.....
Mean of 15 paths	.....	.....	.....	.....	.....	.....	.....	.....	645	26·9
Mean of 53·5 days	.....	.....	.....	.....	.....	.....	.....	.....	580	24·2
Low areas.										
I	1, a. m.	33	102	3, a. m.	46	57	2,550	2·0	1,270	53·1
II	3, p. m.	53	112	7, a. m.	49	54	2,800	3·5	800	33·3
III	5, a. m.	53	120	9, a. m.	47	85	2,050	4·0	513	21·4
IV	7, a. m.	45	126	8, p. m.	53	114	850	1·5	567	27·0
V	9, a. m.	48	124	10, a. m.	52	125	350	1·0	350	14·6
VI	9, a. m.	33	98	14, a. m.	50	55	2,850	5·0	570	23·8
VII	10, a. m.	35	102	14, a. m.	50	55	2,850	4·0	713	29·7
VIII	11, p. m.	32	114	13, a. m.	33	116	600	1·5	400	16·7
IX	12, p. m.	55	114	18, a. m.	48	58	4,750	5·5	864	36·0
X	16, a. m.	49	125	17, a. m.	55	104	1,100	1·0	1,100	45·8
XI	17, a. m.	44	126	18, a. m.	43	126	200	1·0	200	8·3
XII	19, p. m.	53	111	23, a. m.	46	53	3,100	3·5	886	36·9
XIII	21, p. m.	46	123	25, p. m	47	64	3,400	4·0	850	35·4
XIV	25, p. m.	28	98	27, p. m.	46	70	2,150	2·0	1,025	42·7
XV	27, p. m.	40	125	29, p. m.	43	125	300	2·0	150	6·3
XVI	28, a. m.	35	78	29, p. m.	46	61	1,300	1·5	867	36·1
XVII	28, p. m.	49	90	30, p. m.	47	70	950	2·0	475	19·8
XVIII	31, a. m.	47	89	31, p. m.	48	87	100	0·5	.....	.....
Sums	.....	.....	.....	.....	.....	.....	32,200	45·5	11,680	.....
Mean of 17 paths	.....	.....	.....	.....	.....	.....	.....	.....	687	28·6
Mean of 45·5 days	.....	.....	.....	.....	.....	.....	.....	.....	708	29·5

NORTH ATLANTIC METEOROLOGY.

[*Pressure in inches and millimeters; wind-force by Beaufort scale.*]

NORMAL CONDITIONS.

The normal barometric pressure for December over the North Atlantic Ocean, as deduced from international simultaneous meteorological observations taken at Greenwich noon and not reduced to standard gravity, is lowest, 29.50 (749), in a narrow oval stretching from southern Greenland over Iceland to North Cape. A similar depression, 29.60 (752), extends from the Alaskan Peninsula west to Kamchatka. Pressure is highest during December, 30.20 (767), over a small oval over the south Atlantic and Gulf States; a similar area of highest pressure, 30.50 (775), extends along the border land between southern Siberia and northern Mongolia at N. 50°.

As compared with November, the mean pressure in December is generally lower over the central portion of the North Atlantic Ocean and thence northward over Greenland, Baffin Bay, and northern Europe. It is higher over the greater part of North America.

The general path of storm centers during December passes from the Japanese Islands northeast over the southern extremity of Kamchatka to the center of the Alaskan Peninsula, where it subdivides, one-half going eastward into British Columbia, the other half southeast into Oregon, from Oregon eastward to the southern border of Newfoundland, thence northeast to N. 55°, W. 15°, where it again subdivides, one-third going southeast to southern Europe and two-thirds northeast to Norway and northern Europe. The region of maximum frequency of storm tracks extends from the Lake region east to Newfoundland, the average being about five per month.

The general velocity of movement of storm centers during December is 36 miles per hour in the United States and 21 miles on the Atlantic Ocean, 24 miles from the Yellow Sea to Kamchatka, and 20 miles over Bering Sea and southward to Oregon.

OCEAN FOG.

The limits of fog belts west of the fortieth meridian, as determined by reports of shipmasters, are shown on Chart I by dotted shading. East of the fifty-fifth meridian fog was reported on 11 dates; between the fifty-fifth and sixty-fifth meridians on 5 dates; and west of the sixty-fifth meridian on 3 dates. Compared with the corresponding months of the last seven years, the dates of occurrence of fog east of the fifty-fifth meridian numbered 7 more than the average; between the fifty-fifth and sixty-fifth meridians, 1 more than the average, and west of the sixty-fifth meridian, 1 less than the average.

OCEAN ICE.

The limits of the region within which field ice or icebergs were reported for December, 1894, are shown on Chart I by crosses.

The easternmost ice (several small bergs, reported on the 9th) was in N. 48° 20′, W. 47° 00′, and the southernmost ice, a berg about 60 feet high, reported on the 12th, was in N. 45° 22′, N. 50° 30′.

In December, 1882, 1883, 1884, 1886, 1888, 1891, and 1892, no Arctic ice was reported near Newfoundland and the Grand Banks. In 1885, several bergs were observed off the Newfoundland coast in the early part of the month. In 1887, a small berg was reported in N. 46° 10′, W. 47° 28′ on the 26th, and a small berg in N. 48° 20′, W. 48° 40′ on the 28th. In 1889, large quantities of Arctic ice were reported over and near the Grand Banks. In 1890, a large berg was observed in N. 49° 39′, W. 47° 50′ on the 13th. In 1893, one small berg was reported in N. 47° 05′, W. 50° 43′ on the 27th; on the 29th, one large berg was observed in N. 47° 16′, W. 49° 36′; on the 31st, in N. 47° 35′, W. 49° 00′, a berg about 60 feet high was reported.

TEMPERATURE OF THE AIR.

[*In degrees Fahrenheit.*]

The distribution of the monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart II; the lines are drawn over the high irregular surface of the Rocky Mountain plateau, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

DIURNAL PERIODICITY.

The regular diurnal period in temperature is shown by the hourly means given in Table V for all stations having self-registers.

NORMAL TEMPERATURE.

In Table II, for voluntary observers, the mean temperature is given for each station, but in Table I, for the regular stations of the Weather Bureau, both the mean temperatures and the departures from the normal are given for the current month. In the latter table the stations are grouped by geographical districts, for each of which is given the average temperature and departure from the normal; the normal for any district or station may be found by adding the departures to the current average when the latter is below the normal and by subtracting when it is above.

DEPARTURES FROM NORMAL TEMPERATURE FOR DECEMBER, 1894.

As compared with the normal for December the mean temperatures for the current month were decidedly in excess in Montana, North and South Dakota, Minnesota, Iowa, and Wisconsin, and northward over Saskatchewan and Manitoba. The stations showing the greatest excess were Winnipeg, 10.4; St. Vincent, 9.8; Moorhead, 9.6; Minnedosa, 9.5; Huron, 8.5; Port Arthur, 8.3; Duluth, 8.2.

Considered by districts, the mean temperatures for the current month show the following departures from normal temperatures:

Positive departures: Middle Atlantic, 0.3; south Atlantic, 0.6; east Gulf, 1.1; west Gulf, 1.7; Ohio Valley and Tennessee, 0.8; lower lakes, 2.2; upper lakes, 4.4; North Dakota (extreme northwest), 8.2; upper Mississippi, 4.6; Missouri Valley, 5.1; northern slope, 1.2; middle slope, 0.4; southern slope (Abilene), 0.9; southern plateau, 0.9.

Negative departures: New England, 0.2; Key West, 0.9; middle plateau, 4.5; northern plateau, 2.0; north Pacific, 2.8; middle Pacific, 2.3; southern Pacific, 0.9.

For certain voluntary stations of rather long periods of observation the normal and extreme mean temperatures and the departures are shown in detail in Table X *a*, which is now placed among the meteorological tables instead of being inserted in the text as heretofore.

DAILY AND MONTHLY RANGES OF TEMPERATURE.

The greatest daily range of temperature is given for each of the regular Weather Bureau stations in Table I, which also gives data from which may be computed the extreme monthly ranges for each station:

Greatest daily ranges.—Large values: North Platte, 55; Pueblo, 50; Valentine, 46; Huron, 44; Bismarck, Pierre, and Northfield, 42; St. Vincent, Cheyenne, and Denver, 41; Dodge City, 40. Small values: Astoria, 12; Key West, Fort Canby, and East Clallam, 13; Tatoosh Island, 14; Port Crescent, Port Angeles, and San Francisco, 15; Pysht and Roseburg, 16; Portland, Oreg., and Point Reyes Light, 17; Sacramento and Buffalo, 18.

Extreme monthly ranges.—Large values: Dodge City, 90; Rapid City, 88; Valentine, 86; Wichita, 84; Huron, 83; Bismarck, Pierre, and Pueblo, 82. Small values: Tatoosh Island, 16; Fort Canby, 18; East Clallam, 20; Astoria and San Francisco, 21; Port Crescent and Seattle, 22.

YEARS OF HIGHEST MEAN TEMPERATURE FOR DECEMBER.

The mean temperature for December, 1894, was the highest on record at regular Weather Bureau stations as shown in the following table, which also gives the highest previous record:

Stations.	December, 1894.		Highest previous.	
	Mean temperature.	Departure from normal.	Temperature.	Year.
Moorhead, Minn.	20.6	+9.6	20.3	1881
Tucson, Ariz	54.0	+2.0	52.9	1881

YEARS OF LOWEST MEAN TEMPERATURE FOR DECEMBER.

The mean temperature for December, 1894, was the lowest on record at regular Weather Bureau stations, as shown in the following table:

Stations.	December, 1894.		Lowest previous.	
	Mean temperature.	Departure from normal.	Temperature.	Year.
Roseburg, Oreg	37.2	−6.1	37.4	1884
Winnemucca, Nev	25.3	−6.5	26.4	1891
Carson City, Nev	31.1	−3.8	32.2	1891

MAXIMUM TEMPERATURE.

The maximum temperatures of the month at regular stations of the Weather Bureau are given in Table I, from which it appears that the highest maxima were: San Antonio, 84; Corpus Christi, Palestine, New Orleans, Key West, and Titusville, 81; Jupiter, Jacksonville, Tampa, 81; Dodge City, 79; Abilene, Savannah, Tucson, 78.

The lowest maxima were: St. Vincent, Spokane, 44; Idaho Falls, Baker City, 45; Moorhead, 46.

YEARS OF HIGHEST MAXIMUM TEMPERATURE FOR DECEMBER.

The maximum temperatures for December were the highest on record at regular Weather Bureau stations, as shown in the following table:

Stations.	December, 1894.		Highest previous.	
	Maximum.	Excess above previous record.	Temperature.	Year.
Kittyhawk, N. C	73	0	73	*
Hatteras, N. C.	73	+1	72	1894
New Orleans, La	81	+1	80	*
Corpus Christi, Tex.	81	0	81	1888
Galveston, Tex.	77	+1	76	*
Palestine, Tex	81	0	81	1890
Dodge City, Kans	79	+5	74	1893
Wichita, Kans	74	+1	73	1889
Kansas City, Mo	70	0	70	1889
Green Bay, Wis	51	+1	50	*
Huron, S. Dak.	65	+2	63	1888

*Frequently.

MINIMUM TEMPERATURE.

The minimum temperatures of the month at regular stations of the Weather Bureau are given in Table I, from which it appears that the lowest minima were: St. Vincent, —24; Bismarck, —23; Northfield, —22; Williston, —21; Moorhead, Miles City, Valentine, —20.

Among the highest minima were: Key West, 44; San Diego, 41; San Francisco, 40; Los Angeles, 39; Yuma, 37; Point Reyes Light, 34; Tatoosh Island, 33.

YEARS OF LOWEST MINIMUM TEMPERATURE FOR DECEMBER.

The minimum temperatures for December were the lowest on record at regular Weather Bureau stations, as shown in the following table:

Stations.	December, 1894.		Lowest previous.	
	Minimum.	Deficit below previous record.	Temperature.	Year.
Northfield, Vt.	−22	0	−22	1890
Sault Ste. Marie, Mich	−19	−5	−14	1893
Harrisburg, Pa	4	−5	9	1892
Parkersburg, W. Va.	−4	−4	0	1892
Lexington, Ky	−6	−13	7	1892
Savannah, Ga.	12	−3	15	1880
Jacksonville, Fla	14	−5	19	1880
Titusville, Fla	18	−14	32	1888
Jupiter, Fla.	24	−12	36	*
Key West, Fla	44	−2	46	1894
Pensacola, Fla	14	−3	17	1880
Palestine, Tex	8	−3	11	1887
Abilene, Tex	6	−3	9	1886
Wichita, Kans	−10	−4	−6	1892

*Frequently.

ACCUMULATED TEMPERATURES.

From January 1 to the end of the current month the average temperature for each geographical district was above or below the normal by an amount that is given in the last column of the following table. The accumulated monthly departures from normal temperatures, as given in the second column, may be used for comparison with the departures of current conditions of vegetation from the normal conditions.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
	°	°		°	°
New England	+8.9	+0.7	Key West	−7.4	−0.6
Middle Atlantic	+13.4	+1.1	East Gulf	−0.5	0.0
South Atlantic	+5.5	+0.5	Southern plateau	−9.1	−0.8
West Gulf	+2.2	+0.2	Middle plateau	−8.9	−0.7
Ohio Valley and Tennessee	+12.5	+1.0	Northern plateau	−0.7	−0.1
Lower Lake	+22.7	+1.9	North Pacific	−10.4	−0.9
Upper Lake	+29.4	+2.4	Middle Pacific	−9.1	−0.8
North Dakota (Ex. NW.)	+32.4	+2.7	Southern Pacific	−22.2	−1.8
Upper Mississippi	+26.1	+2.2			
Missouri Valley	+26.5	+2.2			
Northern slope	+12.1	+1.0			
Middle slope	+10.7	+0.9			
Southern slope (Abilene)	+7.9	+0.7			

LIMITS OF FREEZING TEMPERATURE.

The region within which the air has had a freezing temperature at some time during the month is bounded by the isotherm of minimum 32°. The isotherm of minimum 40° presents, approximately, the boundary of the region within which severe frosts are likely to have occurred. During the winter season these lines are shown on the chart of total monthly snowfall, No. VI.

The line of minimum 40° passes east and west across the southern end of the peninsula of Florida, the lowest readings at regular stations being 44° at Key West and 24° at Jupiter. This isotherm apparently passes from the Gulf of Mexico on to the mainland some distance south of Brownsville, and, after crossing Mexico, reappears near San Diego. It then skirts the coast of California, touching it only at San Francisco.

The minimum isotherm of 32° crosses the southern portion of Florida, the extreme southern portion of Texas, and then reappears between Tucson and Yuma, passing northward through California, along the Coast Range, until it strikes the Pacific near Eureka; it reappears at Fort Canby and passes northward along the immediate coast of Washington.

In general the entire United States lay within the minimum line of 40° and with few exceptions within the minimum of 32°.

PERIODS OF HIGH TEMPERATURE.

The maximum temperatures of December in the respective States occurred principally at the following periods:

(A) 5th, Washington and Oregon; 6th, Montana, Wyoming, North Dakota, and Kansas; 7th, in central Missouri, Oklahoma, and Iowa; 8th, in southern Texas, Louisiana, Mississippi, central Kentucky and Tennessee, lower Michigan, and Lake Erie.

(B) 11th, Indiana, Ohio, South Carolina, and west Florida; 12th, east Florida, south Atlantic and middle Atlantic coast, southern New England.

(C) 14th, Nebraska, Minnesota, Wisconsin, Upper Michigan; 15th, Virginia; 16th, middle Atlantic States, lower Lake region, and central New England.

PERIODS OF LOW TEMPERATURE.

The minimum temperatures of December in the respective States occurred principally at the following periods.

(A) 27th, Manitoba, North and South Dakota, Nebraska, Minnesota, and western Iowa; 28th, the upper Lake region, Indiana, Illinois, Missouri, Kansas, Oklahoma, Texas, Arkansas, and western Tennessee; 29th, New York, Ohio, the middle Atlantic and south Atlantic States, Florida, and the Gulf coast, including Key West. While this area of minimum temperature spread mostly to the south and east, it also extended somewhat westward, reaching northern Washington and Montana, southern Idaho, Wyoming, and western Colorado on the 28th, and Oregon, Nevada, and Utah on the 29th.

REGIONS OF 20° FALL IN TWENTY-FOUR HOURS.

A fall of temperature of 20°, or more, in twenty-four hours is indicated on the Daily Weather Map by inclosing the region within which this occurs by a heavy dotted line. According to recent instructions such falls are no longer to be regarded as technical cold waves, the exact definition of which is given in the subsequent paragraph. The following list enumerates the regions of 20° fall for the month of December and the dimensions of the principal axes are stated in miles:

(A) 2d, p. m., 300 by 200, central Texas, and 600 by 100, Arkansas and Kentucky. 3d, a. m., 300 by 200, western Tennessee and West Virginia.

(B) 7th, a. m., 400 by 300, northern New England.

(C) 7th, a. m., 300 by 300, North and South Dakota; 100 by 200, Alberta. 7th, p. m., 100 by 200, Assinniboia.

(D) 9th, a. m., 200 by 200, Indiana.

(E) 12th, p. m., 200 by 100, Kentucky. 13th, a. m., 100 by 100, Georgia and South Carolina.

(F) 16th, a. m., 100 by 200, South Dakota and western Nebraska; also, 100 by ——, Assinniboia and Saskatchewan.

(G) 17th, a. m., 1,100 by 400, Manitoba, Ontario, Lakes Superior and Michigan, Illinois, and Indiana. 17th, p. m., 400 (?) by 900 (?), Ontario, Lake Ontario, central New York, central Pennsylvania, and West Virginia. 18th, a. m., 500 (?) by 400, Quebec, New Brunswick, northern New England, northern New York. 18th, p. m., 300 by 500, New Brunswick, northern New England, and Nova Scotia.

(H) 20th, p. m., 400 by 300, Alberta, Assinniboia, Saskatchewan. 21st, a. m., 200 by 200, Wyoming; also, 300 by 200, Assinniboia and Manitoba. 21st, p. m., 700 by 600 (?), Manitoba, Ontario, Lake Superior, North and South Dakota, Minnesota. 22d, a. m., 100 by 300, Missouri, Iowa; also, 600 by 500, Ontario, Lakes Superior, Huron, Michigan, northern Wisconsin. 22d, p. m., 1,000 by 300, Quebec, Lakes Huron and Ontario, northern New York, New England, and New Brunswick. 23d, a. m., 1,100 by 500, eastern New York and Pennsylvania, all of New England, Nova Scotia, New Brunswick, and the Gulf of St. Lawrence. 23d, p. m., 500 by 300, New Brunswick, Nova Scotia, and Cape Breton.

(I) 24th, a. m., 300 by 100, Wyoming. 24th, p. m., 600 by 200, Manitoba, South Dakota, and portions of Minnesota and North Dakota. 25th, a. m., 100 by 200, northern Texas; also, 400 by 300, Nebraska and South Dakota; also, 900 by 400, Manitoba, Ontario, North Dakota, Minnesota, and Lake Superior. 25th, p. m., 300 by 100, Arkansas and Tennessee; also, 900 by 200, Colorado, Kansas, Oklahoma, northern Texas; also, 700 by 300, Ontario, Quebec, northern portion of Lakes Superior and Huron. 26th, a. m., 300 by 100, Louisiana and Mississippi; also, 400 by 300, southern Texas; also, 300 by 200, Colorado and northern Texas; also, 100 by 700 (?), Ontario, Quebec, New Brunswick, and northern New England. 26th, p. m., 200 by 200, Virginia and North Carolina; also, 1,100 by 200, Georgia, Alabama, and southern portions of Mississippi, Louisiana, and Texas; also, about 300 by 400, New Brunswick and Nova Scotia; also, 800 by 400, Saskatchewan, Assinniboia, Manitoba, North Dakota, and Minnesota. 27th, a. m., 700 by 400, northern Florida and southern Georgia, Alabama, Mississippi, and Louisiana; also, 800 by 500, South Dakota and portions of Minnesota, Wisconsin, North Dakota, Montana, Wyoming, and Nebraska. 27th, 8 p. m., 500 by 200, Florida and the coasts of Georgia and South Carolina; also, 400 by 100, Kansas and Oklahoma; also, 400 by 200, Wisconsin, Iowa, and Missouri. 28th, a. m., 100 by 200, southern Michigan; also, 400 by 100, New Jersey, eastern Pennsylvania, New York, and southern New England. 28th, p. m., 100 by 300, Georgia and South Carolina; also, 300 by 200, Maine and portions of Quebec and New Brunswick. 29th, a. m., 200 by 100, New Brunswick. 30th, a. m., 100 by 100, Cape Breton.

(J) 29th, a. m., 200 by 200 (?), Alberta. 30th, a. m., 200 by 100, Montana.

REGIONS OF 20° RISE IN TWENTY-FOUR HOURS.

The daily weather charts show by heavy dotted lines the regions within which the temperature has risen 20° in the preceding twenty-four hours. The following list enumerates all of these regions on the maps for 8 a. m. and 8 p. m., and gives the dimensions of the principal axes in miles:

(A) 2d, p. m., 100 by 100, Manitoba.

(B) 6th, a. m., 400 by 200 and 300 by 200, South Dakota, Nebraska, and Kansas.

(C) 7th, a. m., 200 by 100, Missouri. 8th, a. m., 300 by 300, West Virginia.

(D) 11th, p. m., 300 by 200, Alberta and Montana.

(E) 18th, p. m., 200 by ——, Lake Superior; 19th, a. m., 300 by ——, Ontario.

(F) 18th, p. m., 400 by ——, Alberta, Saskatchewan, and Assinniboia. 19th, a. m., 200 by 200, Saskatchewan.

(G) 22d, a. m., 200 by 100, Virginia.

(H) 22d, a. m., 300 by 200, Gulf of St. Lawrence.

(I) 25th, a. m., 600 by 800, New England, Nova Scotia, New Brunswick, and the Lower St. Lawrence.

(J) 25th, p. m., 300 by ——, Gulf of St. Lawrence and Nova Scotia.

(K) 27th, p. m., 300 by ——, Assinniboia and Saskatchewan. 28th, a. m., 500 by 200, North Dakota and Minnesota. 28th, p. m., 500 by 400, North and South Dakota, Nebraska, Iowa, and southern Minnesota; also, 400 by ——, Lake Superior and northward. 29th, a. m., 300 by 200, upper Lake region, and 100 by 200, Illinois and Wisconsin. 29th, p. m., 200 by 200, upper Lake region; 200 by 100, Tennessee; and 200 by 100,

Texas and Louisiana. 30th, a. m., 200 by 200, Ontario, and 800 by 200, West Virginia, Kentucky, Tennessee, Mississippi, Louisiana, and eastern Texas. 30th, p. m., 300 by 100, New England, and 200 by 100, the coast of Louisiana and Alabama. 31st, a. m., 200 by 100, central Florida.

(L) 27th, p. m., 300 by 500, New England, New Brunswick, Nova Scotia, and the Gulf of St. Lawrence. 28th, a. m., 300 by 300, New Brunswick, Nova Scotia, and the Gulf of St. Lawrence.

(M) 29th, a. m., 200 by 200, Montana.

FROSTS.

The frosts reported by the voluntary observers of the Weather Bureau usually have reference to the injury done to tender plants, and the classification "light" or "heavy" depends almost entirely upon the nature of the plant. In general, it may be assumed that a light frost will injure the most sensitive vegetables that are raised by methods of forcing, while the heavy frosts will injure hardy fruits and grains that ripen in the open air. In both cases, however, the extent of the injury will largely depend upon the location of the plant, namely, whether in a quiet valley or on an elevated spot. The meteorologic phenomenon of hoar frost accompanies the occurrence of a frost properly so called by the agriculturist; a freezing temperature without hoar frost is a dry freeze or a cold wave, according to its intensity The isotherms of minimum 40° and minimum 32° are shown on Chart VI.

The principal frosts of December occurred in the southern portion of the United States in connection with the area of high pressure No. X, and on the dates, 27th, 28th, and 29th, as enumerated in connection with the areas of 20° fall in temperature. The low temperature and the severity of the frost in Florida were quite unprecedented in recent years, and the following extracts from the reports of observers are worthy of record:

Montgomery, Ala.—28th, a light flurry of snow occurred at 5 a. m., lasting till 5.40 a. m. Total amount, trace. Minimum and 8 a. m. temperature, 20. Brisk to high northwest winds prevailed, maximum velocity, 28 northwest, at 5.45 a. m., continuing brisk and high all day. The diurnal range of temperature was remarkably small, the maximum reaching only 23.2—a range of only 3°—and this is the lowest maximum on record. December 20, 1880, the maximum was 24; that of to-day 0.8° lower. After 8 a. m. the sky cleared, remaining so all day. The day was bitter cold and blustery, causing considerable discomfort to the people of this section.

Mobile, Ala.—28th, freezing temperature prevailed all day, and much apprehension is felt over the safety of farm and garden produce. 29th, very high pressure and cold weather, the minimum temperature being 16.1, second to the lowest that ever occurred at this station during the month of December.

Savannah, Ga.—29th, the temperature this morning fell to 12, the lowest ever recorded at this station in the month of December, and as low as ever recorded since the establishment of the Weather Bureau in 1871. 12 was reached but once before, on January 12, 1886.

Jacksonville, Fla.—27th, cold wave; temperature fell from 60. at 8 a. m. of 26th, to 36 at 8 a. m. of 27th; fresh to high west and northwest winds. 28th, cold wave continues; temperatures ranged from 27 to 38; at midnight of this date the temperature had fallen to 19.5, and was going down at the rate of about 1° an hour; from sunset to 10.30 p. m., ice three-quarters of an inch thick froze on a bucket of water on the office roof. 29th, the temperature fell to 14 about 7 a. m., the lowest point recorded since the station was established, and 1.3° lower than the memorable freeze of January 12, 1886; maximum temperature to-day, 34; ice 2½ inches thick froze on water in a bucket in the office.

Titusville, Fla.—29th, the temperature fell rapidly during the night, minimum being 18.5, which is the lowest recorded at this station since it was established, and probably the lowest that has occurred in a great many years. At 8 a. m. the temperature was 20 and partly cloudy, with brisk northwest winds which kept up during the greater part of the day. Mean temperature, 26; a fall of 13° from the mean of yesterday, and 35° below the normal.

Tampa, Fla.—29th, weather last night was extremely cold, and this morning a minimum temperature of 18.9 is recorded. This is 1° lower than the minimum of 1886, as recorded in the January REVIEW of that year. Everything in the shape of vegetation is frozen. Ice to the thickness of from 1½ to 2 inches is general, and in several dwellings ice formed to the thickness of ¼ an inch. The weather at 8 p. m. does not give much hope for improvement to-night. 30th, freezing weather continued throughout the night, the minimum temperature at 8 a. m., 22.9. The temperature rose during the day to a maximum of 60.

Jupiter, Fla.—29th, coldest weather since the establishment of the station in 1888. Minimum temperature, 24. Next coldest day, March 3, 1890, minimum temperature, 33.

Key West, Fla.—29th, day opened cloudy and very cold; cleared between 9 and 10 a. m., and remained clear. At 11 a. m., the minimum temperature, 43.6, was recorded; after this there was a slow but steady rise. Since the establishment of this station 43.6 is the lowest temperature recorded during the month of December.

The following table shows the dates of the occurrence of the first light and heavy frosts and the first snow of the season at the respective stations. When the observer makes no mention of frost the first occurrence of a minimum temperature of 32° is selected and the date is given in the table. The dagger at the right of the name of the station indicates, therefore, a minimum temperature of 32° with or without frost:

Dates of first light and heavy frosts and snow, December, 1894.

State and station.	First frost.		Snow.
	Light.	Heavy.	
Alabama.			
Ashville	.....	.....	30
Bermuda	.....	.....	28
Carrollton	.....	.....	30
Cordova	.....	.....	28
Decatur	.....	.....	27
Evergreen	.....	.....	28
Florence	.....	.....	30
Gadsden	.....	.....	30
Greensboro	.....	.....	28
Highland Home	.....	.....	28
Jasper	.....	.....	30
Lock No. 4	.....	.....	30
Madison Station†	.....	.....	30
Marion	.....	6	30
Montgomery	.....	.....	28
Newburg	.....	.....	26
Opelika	.....	.....	27
Oxanna	.....	.....	30
Pushmataha	.....	.....	28
Rock Mills	.....	.....	30
Scottsboro	.....	.....	26
Selma	.....	.....	27
Valley Head	.....	.....	28
Wilsonville	.....	.....	30
Arizona.			
Bisbee	.....	31	.....
Buckeye†	.....	3	.....
Dudleyville†	.....	5	.....
Farleys Camp†	.....	10	.....
Flagstaff	.....	.....	5
Globe	.....	10	.....
Keams Canyon	.....	.....	8
Lochiel†	.....	11	.....
Mount Huachuca†	.....	11	13
Natural Bridge	.....	16	.....
Nogales†	.....	11	.....
Oracle†	.....	11	.....
Phœnix†	.....	3	.....
Reymert†	.....	24	.....
Show Low	.....	.....	8
Signal†	.....	12	.....
Tucson	.....	11	.....
Yuma	1	.....	.....
Arkansas.			
Bee Branch	.....	.....	26
Blanchard Springs	.....	.....	30
Brinkley	.....	.....	30
Camden	.....	.....	31
Conway	.....	.....	26
Fayetteville	.....	.....	26
Forrest City	.....	.....	26
Fort Smith	.....	.....	26
Helena	.....	.....	26
Hot Springs	.....	.....	26
Keesees Ferry	.....	.....	10
Little Rock	.....	.....	26
Loanoke	.....	.....	26
Luna Landing	.....	.....	30
Mount Nebo	.....	.....	25
New Gascony	.....	.....	26
Newport	.....	.....	26
Osceola	.....	.....	26
Ozark	.....	.....	27
Pocahontas	.....	.....	26
Rison	.....	.....	25
Rogers	.....	.....	25
Searcy	.....	.....	25
Stuttgart	.....	.....	26
Winslow	.....	.....	26
California.			
Adin	.....	.....	6
Bakersfield	.....	1	.....
Barstow	.....	.....	8
Berkeley	24	.....	.....
Escondido†	.....	3	.....
Eureka	.....	10	.....
Florin†	.....	24	.....
Folsom City	.....	25	.....
Fremontville	.....	1	.....

State and station.	First frost.		Snow.
	Light.	Heavy.	
California—Cont'd.			
Fresno	.....	2	.....
Georgetown	.....	.....	6
Grass Valley	.....	.....	9
Healdsburg†	.....	16	.....
Iowa Hill	.....	10	9
Kono Tayee	.....	24	.....
Lick Observatory	.....	.....	6
Lodi	.....	10	.....
Manzana	.....	11	.....
Mariposa	.....	13	.....
Milton (near)	.....	25	.....
Mokelumne Hill	.....	25	.....
Nevada City	.....	.....	8
Newcastle†	.....	24	.....
Orangevale†	.....	2	.....
Oroville†	.....	23	.....
Palermo	.....	1	.....
Petaluma†	.....	25	.....
Redding	.....	10	.....
Red Bluff	.....	1	.....
Rio Vista†	.....	24	.....
Sacramento (W. B.)	.....	1	.....
San Bernadino	.....	3	.....
San Diego	9	.....	.....
Santa Clara†	.....	25	.....
Shasta Springs	.....	.....	3
Stanford University	.....	25	.....
Stockton†	.....	25	.....
Susanville	.....	.....	2
Walnut Creek†	.....	2	.....
Wheatland	.....	1	.....
Yreka	.....	.....	5
Delaware.			
Millford	.....	.....	26
Millsboro	.....	.....	31
Seaford	.....	.....	26
District of Columbia.			
Washington (W. B.)	.....	.....	25
Florida.			
Avon Park	.....	29	.....
Brooksville	.....	27	.....
Clermont	.....	29	.....
Eustis	.....	29	.....
Federal Point	.....	28	.....
Fort Meade†	.....	29	.....
Grasmere	.....	29	.....
Hypoluxo†	.....	29	.....
Jupiter†	.....	29	.....
Kissimmee	.....	28	.....
Manatee†	.....	29	.....
Merritts Island	.....	29	.....
Mullet Key	.....	28	.....
Myers	.....	29	.....
New Smyrna	.....	29	.....
Oak Hill	.....	29	29
Ocala†	.....	29	.....
Orange City	.....	29	.....
Orlando	.....	28	.....
Tallahassee	.....	27	.....
Tampa	.....	29	.....
Tarpon Springs	.....	29	.....
Titusville	.....	29	.....
Georgia.			
Adairsville	.....	.....	28
Alapaha	.....	.....	27
Athens	.....	.....	30
Atlanta	.....	.....	26
Augusta	.....	.....	30
Bainbridge	.....	.....	27
Brag	.....	7	.....
Canton	.....	.....	28
Clayton	.....	.....	30
Covington	.....	.....	28
Dahlonega	.....	.....	26
Diamond	.....	.....	28
Dublin	.....	.....	30
Elberton	.....	.....	30
Fleming†	.....	1	.....
Forsyth	.....	.....	30

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost. Light.	First frost. Heavy.	Snow.
Georgia—Cont'd.			
Fort Gaines			30
Hephzibah		17	30
Lagrange			30
Louisville			31
Macon			30
Marietta			30
Morgan			28
Point Peter †			30
Resaca			28
Rome			30
Thomasville			28
Toccoa			30
Washington			30
Whitesburg			30
Illinois.			
Cairo			26
Clear Creek			27
Halliday			27
Jordans Grove			26
Lagrande			27
Mascoutah			26
Mattoon			27
Mount Carmel			27
Streator			27
Indiana.			
Huntington			25
Laconia			26
Indian Territory.			
Eufaula			29
Healdton			26
Kepp			25
Kansas.			
Abilene			10
Altoona			26
Beloit			10
Burlington			11
Coldwater			25
Coffeyville			26
Concordia			10
Cunningham			10
Downs			10
Eldorado			25
Elk City			25
Emporia			11
Fort Riley			10
Grenola			25
Hays City			10
Ionia			11
Kiowa			25
Lawrence			10
Lebo			11
Macksville			10
Medicine Lodge			25
Minneapolis			10
Ness City			10
New England Ranch			10
Oberlin			10
Oswego			26
Pleasant Dale			10
Quinter			10
Sedan			25
Wakefield			11
Wamego			11
Winfield			25
Yates Center			25
Kentucky.			
Bowling Green			26
Burnside			28
Caddo			26
Canton			26
Eddyville †			26
Falmouth			27
Hendricks			27
Middlesboro			26
Paducah			26
Princeton			26
Russellville			26
Sandy Hook			26
Springfield			26
Louisiana.			
Cameron		27	
Farmerville			26
Grand Coteau		27	
Hammond		28	
Liberty Hill			26
New Iberia		27	
New Orleans	20	28	
Paincourtville		27	
Shell Beach		26	
Maryland.			
Charlotte Hall			26
Chestertown			26
Cumberland			26
Denton †			26
Frederick			26
Glyndon			26
La Plata			31
Pocomoke City			26
Princess Anne			26
Solomons †			26
Woodstock			26
Massachusetts.			
Fiskdale			2
Mississippi.			
Agricultural College			27
Bay St. Louis †		27	
Brookhaven			28
Clarksdale		4	30
Duck Hill			29
French Camps			28
Fulton			30
Greenville			30
Hattiesburg			30
Louisville			27
Palo Alto			27
Pontotoc			20
Rosedale			30
Stonington			26
Thornton			30
University			26
Vaiden			28
Vicksburg			28
Water Valley			27
Missouri.			
Appleton City			26
Bethany			11
Birch Tree			26
Bluffton			27
Carthage			26
Cowgill			27
Darksville			11
Edge Hill			26
Eight Mile			11
Emma			27
Fayette			11
Fox Creek			26
Gayoso			26
Glasgow			11
Gordonville			26
Harrisonville			10
Hastain			25
Houston			26
Humanville			25
Lamar			26
Lebanon			26
Linn Creek			26
Marble Hill			25
Mexico			26
Mine La Motte			26
Mount Vernon			26
New Boston			1
New Madrid			26
Oakfield			26
Oak Ridge			27
Olden			26
Oto			26
Palmyra			11
Panacea			26
Poplar Bluff			26
Princeton			11
St. Joseph			11
Sarcoxie			25
Shelbina			13
Sublett			11
Tindall			26
Vera Cruz			25
Vermont †			27
Vilas			11
Virgil City			26
Warrenton			27
Wheatland			26
Nebraska.			
Arborville			10
Beaver City			11
Creighton			11
Crete			11
Franklin			10
Genoa			10
Glenwood			10
Hebron			10
Minden			10
O'Neill			26
Palmer			11
Red Cloud			10
Stanton			10
Superior			10
Tekamah			10
Weeping Water			11
West Point			31
Whitman			24
Wilcox			10
York			10
Nevada.			
Downeyville			6
Elko			9
Genoa			6
Halleck			6
Hawthorne			9
Hot Springs			6
Mill City			12
Palisade			6
Reno			6
St. Clair			7
Sunnyside			5
Nevada—Cont'd.			
Toano			6
Terington			6
Winnemucca			5
New Jersey.			
Barnegat			26
Beach Haven			26
Charlotteburg			10
Egg Harbor City			26
Franklinville			26
Friesburg			26
Imlaystown			27
Millville			26
Pensauken			26
Vineland			26
Whiting †			26
Woodbine			26
New Mexico.			
Albert			5
Alma			28
Bloomfield			7
East Las Vegas			8
Galisteo			10
Raton			2
Rosa			5
Roswell			27
Santa Fe			5
Springer			24
North Carolina.			
Chapel Hill			30
Charlotte			27
Currituck Inlet			31
Fair Bluff			28
Falkland			28
Fayetteville			29
Greenville			31
Hatteras		29	28
Henderson			28
Kittyhawk			28
Lenoir			26
Littleton			30
Moncure			29
Morganton			27
Mount Airy			26
Mount Pleasant			26
Newbern			30
Pantego			28
Pittsboro			28
Raleigh			27
Rockingham			28
Salisbury			26
Saxon			27
Selma			28
Sloan			28
Southern Pines			28
Southport			28
Tarboro			28
Willeyton			28
Wilmington			28
Oklahoma.			
Alva			25
Arapaho			25
Burnette			25
Clifton			25
Guthrie			25
Norman			25
Oklahoma			25
Ponca			25
Pond Creek			25
Sac and Fox Agency			25
Stillwater			25
Winnview			26
Oregon.			
Albany			6
Arlington			7
Ashland			6
Astoria		15	6
Aurora			6
Baker City			5
Canyon City			6
Cornelius			5
Eugene			6
Grants Pass			6
Happy Valley			5
Heppner			6
Hood River (near)			7
Jacksonville			7
Joseph			5
Lone Creek			6
McMinnville			8
Mount Angel			7
Pendleton			20
Portland			6
Roseburg			6
Sparta			5
Springbrook			6
The Dalles			7
Vale			5
Williams			6
Pennsylvania.			
Altoona			11
Huntingdon			10
Kennett Square			26
Pennsylvania—Cont'd.			
Pottstown			26
Saltsburg			26
West Chester			26
South Carolina.			
Anderson			30
Blackville			30
Blenheim			28
Branchville			28
Camden			29
Charleston			31
Cheraw			29
Columbia			28
Conway			28
Cross Hill			28
Darlington		7	
Effingham			28
Flint Hill			28
Georgetown			30
Greenwood			30
Hollands Store			30
Kingstree			28
Little Mountain			28
Longshore			28
Mount Carmel			30
Pinopolis			28
St. Stephens			28
Shaws Fork			28
Society Hill			28
Statesburg			28
Timmonsville †		29	28
Trenton			30
Trial			28
Watts			30
Yorkville			28
Tennessee.			
Carthage			27
Charleston			28
Clarkesville			26
Clinton			31
Columbia			28
Covington			26
Harriman			30
Jackson			26
Johnsonville			26
Kingston			27
Loudon			30
Memphis			26
Nunnelly			25
Palmetto			30
Parksville			28
Rockwood			30
Rugby			27
Strawberry Plains			30
Texas.			
Amarillo			10
Bellville †		28	
Brady		27	
Coldwater			10
Columbia †		27	
Corpus Christi		27	
Flower Bluff †		28	
Forestburg †		3	
Fort Brown †		28	
Fort Stockton		28	
Fort Worth †		27	
Galveston		28	
Happy			25
Hartley			26
Houston †		28	
Orange †		27	
Rockport †		28	
Sierra Blanca †		10	
Sulphur Springs		11	
Utah.			
Cisco			5
Deseret			30
Fort Du Chesne			7
Koosharem			1
Lake Station			5
Manti			5
Moab			1
Mount Pleasant			5
Parowan			8
Snowville			5
Virginia.			
Alexandria			25
Buchanan			26
Cape Henry			28
Christiansburg			26
Hampton			31
Marion			26
Nottoway			26
Smithville			25
Stanardsville			26
Stephens City			26
Warsaw			27
Washington.			
Aberdeen			6
Centerville			7
Elbe			6
Everett			6
Ferry			7

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.		Snow.	State and station.	First frost.		Snow.
	Light.	Heavy.			Light.	Heavy.	
Washington—Cont'd.				*Washington*—Cont'd.			
Fort Canby			6	Union City			6
Index			16	Vashon			7
Lapush			7	Walla Walla			7
Madrone			7	*West Virginia.*			
Pine Hill			1	Central Station			26
Port Crescent			6	Harpers Ferry			26
Pysht			6	Hinton			27
Seattle			6	Leachtown			25
Silver Creek			6	Martinsburg			26
Snohomish			7	Monarch			26
Sunnyside			7	New Martinsville			26
Tacoma			7	Nuttallburg			26
Tatoosh Island			6	Tannery			26

COLD-WAVE SIGNALS.

The principal cold wave of the month was that of the 28–29th, and the warnings issued in its advance for Florida are stated in the history of high area No. X.

The cold-wave signals displayed during this month are to be interpreted in accordance with Instructions No. 76 of 1894, but the modified instructions, No. 3 of 1895, will go into effect January 1, 1895. The details of the current instructions are given on page 449 of the REVIEW for November.

In accordance with these instructions the following cold-wave signals were ordered during the month of December:

7th, 10.20 a. m., Pierre, Cheyenne, Lander, Denver, Pueblo, Valentine, Omaha, Moorhead, St. Paul, Duluth, Minneapolis, Des Moines, Dubuque, Davenport, Keokuk, St. Louis, Springfield, Mo., Columbia, Mo., Kansas City, Hannibal, and La Crosse.

16th, 10.50 a. m., Dubuque, Duluth, La Crosse, Green Bay, Milwaukee, Chicago, Marquette, Sault Ste. Marie, Grand Haven, Port Huron, and Detroit; p. m., Toledo, Sandusky, Cleveland, Columbus, Cincinnati, Louisville, Buffalo, Rochester, Oswego, Ithaca, Erie, Pittsburg, Parkersburg, and Albany.

21st, 10 a. m., Duluth and Marquette; p. m., Green Bay and Alpena.

22d, a. m., Albany, Northfield, Portland, and Boston.

23d, 8 a. m., Cheyenne and Lander; p. m., Rapid City, Pierre, Huron, and Valentine.

24th, p. m., St. Louis, Springfield, Ill., Chicago, Springfield, Mo., Sault Ste. Marie, Alpena, Grand Haven, and Indianapolis.

25th, a. m., Palestine, Fort Smith, Little Rock, Shreveport, Toledo, Sandusky, Cleveland, Columbus, Cincinnati, Louisville, Nashville, Memphis, Buffalo, Rochester, Oswego, Ithaca, Erie, Pittsburg, Parkersburg, Albany, Northfield, Portland.

26th, 4.30 p. m., Lincoln, Kansas City, Yankton, Omaha, Topeka, Sioux City, Des Moines, Dubuque, Davenport, Keokuk, La Crosse, and Milwaukee; p. m., Green Bay, Chicago, Marquette, and Grand Haven.

27th, 10.30 a. m., Lansing, Columbia, Mo., St. Louis, Springfield, Mo., Hannibal, Springfield, Ill., Cairo, Port Huron, Detroit, and Indianapolis; a. m., Toledo, Sandusky, Cleveland, Columbus, Cincinnati, Louisville, Buffalo, Rochester, Oswego, Erie, Pittsburg, and Atlanta.

27th, p. m., San Antonio, Palestine, Galveston, Corpus Christi, Little Rock, Shreveport, New Orleans, Nashville, Memphis, Knoxville, Chattanooga, Vicksburg, Meridian, Montgomery, Portland, Boston, New London, New Haven, and Lynchburg.

28th, a. m., Mobile and Pensacola.

HUMIDITY.

HUMIDITY.

The quantity of moisture in the atmosphere at any time may be expressed by means of the weight contained in a cubic foot of air. This is usually known as the absolute measure and is equivalent to giving the tension or pressure of the vapor, or the temperature of the dew-point. The mean dew-points for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, are given in Table I. The vapor pressures and the resulting dew-points, absolute humidities, and relative humidities are all deduced from observations of the wet-bulb thermometer by means of formulæ and tables that were first devised by August and subsequently modified by Regnault, 1845, and Ferrel in 1885, but which are still considered to be open to further improvement. In a general way the dew-points given in Table I are probably slightly lower than they should be, owing to the omission since 1887 of a correction for barometric pressure. There is also an uncertainty in the psychrometric formula which is only just now beginning to be understood, by virtue of which at temperatures below freezing the dew-points and the humidities are higher than they should be. For these reasons the monthly averages of the dew-points and relative humidities are subject to some uncertainty.

AVERAGE HUMIDITY.

The temperature of the wet bulb of the psychrometer is the temperature at which evaporation is going on from a special surface of water on muslin at any moment, but a properly constructed evaporometer may be made to give us the *quantity of water evaporated* from a *similar surface* during any interval of time. Such an evaporometer, therefore, would sum up or integrate the effect of those influences that determine the temperature as given by the wet bulb; from this evaporation the average humidity of the air during any given interval of time may be deduced. Instead of attempting to make a self-registering wet-bulb thermometer we may use the evaporometer as an equivalent. A formula for determining the average vapor tension during an hour was given in 1887, at page 376 of the Treatise on Meteorological Apparatus and Methods (in the section on the use of the evaporometer as an integrating hygrometer), as based on the careful measurements made by Mr. Desmond Fitzgerald and published in the Transactions of the American Society of Civil Engineers, 1886.

It is much to be desired that one or more new series of measurements of evaporation, wind velocity, temperature, and dew-point be made at high and low stations in instrument shelters similar to those used by the Weather Bureau, in order that a general empirical formula may be devised for use with the evaporometer considered as an integrating hygrometer.

WET-BULB OR SENSIBLE TEMPERATURES.

The sensation of heat experienced by the human body and attributed to the atmosphere depends not merely upon the temperature of the air, but especially upon its dryness and the force of the wind. It would seem that the rapid evaporation from the skin in dry, hot weather reduces the temperature of the layer of nerve cells at the surface of the skin. This reduction is not measurable by thermometers which give the temperature of large masses but is appreciated by the minute nerves that end in those microscopic cells. This reduction of temperature, or sensible coolness, is apparently

proportional to the difference between the dry and wet-bulb thermometers, and as shown by the chart accompanying Professor Harrington's memoir on "Sensible Temperatures," June 1, 1894, it amounts on the average to 20° in the month of July in Arizona, Nevada, and Utah and 10° in Kentucky, Indiana, and Ohio.

The resulting sensible temperatures, as shown on his second chart, are simply the so-called average temperatures of the wet-bulb thermometer as obtained by the whirling apparatus used in the shaded shelter, and correspond to the temperatures felt by persons standing in the shade of trees or houses, exposed to a natural breeze of at least 6 miles per hour. The temperature of the wet-bulb thermometer and its depression below the dry bulb are the fundamental data for all investigations into the relation between human physiology and the atmosphere. In order to present a monthly summary of the atmospheric conditions from a hygienic and physiological point of view, Table I*a* has been prepared, showing the maximum, minimum, and mean readings of the wet-bulb thermometer at 8 a. m. and 8 p. m., seventy-fifth meridian time.

PRECIPITATION.

[*In inches and hundredths.*]

The distribution of precipitation for the month of December, 1894, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III; the first of these also gives the average departures from the normal for each district, whereas the average departure for each State is given in Table XII for each State Weather Service. Unless otherwise stated, the snow or hail is understood to be melted and added to the rainfall.

DIURNAL VARIATION.

Table IV*b* gives the total precipitation for each hour of seventy-fifth meridian time, as deduced from self-registering gauges kept at about 43 regular stations of the Weather Bureau; of these 37 are float gauges and 6 are weighing gauges.

NORMAL PRECIPITATION FOR DECEMBER.

The normal precipitation for December is shown on Chart IX of the Atlas of Bulletin C, entitled "Rainfall and Snow of the United States, Compiled to the End of 1891, with Annual, Seasonal, Monthly, and other Charts," by Mark W. Harrington, Chief of the Weather Bureau, Washington, 1894. From this Chart it appears that the region of greatest rainfall in December on the Pacific coast is the northwest corner of Washington, with a normal of 14 inches; on the Atlantic coast it is at Cape Hatteras, with a normal of 5 inches, which also extends over portions of northern Georgia, Alabama, Mississippi, and Louisiana. Less than 1 inch is to be expected over any portion of the eastern and northern Rocky Mountain slope.

PRECIPITATION FOR CURRENT MONTH.

The precipitation for the current December was heaviest in the northwest portion of California and southwest corner of Oregon. The snowfall was also remarkably heavy on the upper portions of the Sierra and Coast ranges, as shown in detail in a following section.

CURRENT DEPARTURES FROM NORMAL PRECIPITATION.

The precipitation for December was deficient over the whole of the United States, except a few small areas, i. e., California and Nevada, Lake Superior, eastern Kentucky and Tennessee, and thence to central New England.

The principal departures from the normal at Weather Bureau stations were as follows:

Excesses: Red Bluff, 5.7; Sacramento, 4.6; Eureka, 4.2; San Francisco, 3.8; Fresno, 2.6.

Deficits: Fort Canby, 5.5; Olympia, 5.0; Portland, Oreg., 4.8; Astoria, 4.3; Galveston, 3.9; Charleston and Savannah, 3.2.

Considered by districts, the precipitation for December, 1894, when compared with the normal for the month, furnishes the departures given in Table I, as expressed in inches. By dividing those departures by the normal precipitation for December we obtain the following corresponding percentages (precipitation is in excess when the percentage of the normal exceeds 100):

Above the normal: New England, 123; middle Atlantic, 103; Ohio Valley and Tennessee, 108; lower Lake, 134; southern plateau, 140; middle plateau, 122; middle Pacific, 181; southern Pacific, 133.

Normal: Middle slope, 0.00.

Below the normal: South Atlantic, 56; Key West, 14; east Gulf, 77; west Gulf, 57; upper Lake, 77; North Dakota (extreme northwest), 47; upper Mississippi, 85; Missouri Valley, 64; northern slope, 60; southern slope (Abilene), 35; northern plateau, 47; north Pacific, 69.

For certain voluntary stations of rather long periods of observation the normal and extreme monthly precipitations and the departures are shown in detail in Table X *b*, which is now placed among the meteorological tables instead of being inserted in the text as heretofore.

YEARS OF GREATEST PRECIPITATION FOR DECEMBER.

The precipitation for the current month was the greatest on record for the month of December at regular Weather Bureau stations, as shown in the following table:

Station.	Current precipitation.		Previous maximum.	
	Amount.	Departure.	Amount.	Year.
Fresno, Cal.	4.09	+2.6	3.99	1891
Nantucket, Mass.	5.83	+2.4	4.93	1886

YEARS OF LEAST PRECIPITATION FOR DECEMBER.

The precipitation for the current month was the least on record for the month of December at regular Weather Bureau stations, as shown in the following table:

Station.	Current precipitation.		Previous minimum.	
	Amount.	Departure.	Amount.	Year.
Key West, Fla.	1.26	— 1.6	0.27	1874
San Antonio, Tex.	0.04	— 1.7	0.27	1889
Dubuque, Iowa.	0.35	— 1.6	0.52	1876
North Platte, Nebr.	T.	— 0.7	0.03	1890
Valentine, Nebr.	0.05	— 0.6	0.10	1886
Pierre, S. Dak.	0.08	— 0.4	0.08	*
Bismarck, N. Dak.	0.06	— 0.7	0.06	1881
Walla Walla, Wash.	0.80	— 1.7	0.94	1890
Fort Canby, Wash.	1.63	— 3.7	3.07	1885

*Frequently.

ACCUMULATED PRECIPITATION.

The total accumulated monthly departures from normal precipitation from the beginning of the year to the end of the current month are given in the second column of the fol-

lowing table; the third column gives the ratio of the current accumulated precipitation to its normal value:

District.	Accumulated departure.	Accumulated precipitation.	District.	Accumulated departure.	Accumulated precipitation.
	Inch.	*Per ct.*		*Inch.*	*Per ct.*
Key West	+ 2.00	195	New England	— 8.10	82
Middle slope	+ 0.40	102	Middle Atlantic	— 5.30	89
Middle plateau	+ 0.20	102	South Atlantic	— 4.20	93
Northern plateau	+ 0.90	105	East Gulf	— 9.00	85
North Pacific	+11.70	119	West Gulf	— 6.80	86
Middle Pacific	+ 1.80	106	Ohio Valley and Tennessee	—11.10	76
			Lower Lake	— 4.50	87
			Upper Lake	— 2.00	94
			North Dakota (Ex. N.W.)	— 0.50	97
			Upper Mississippi	—12.00	67
			Missouri Valley	— 8.84	72
			Northern slope	— 1.40	90
			Southern slope (Abilene)	— 3.70	87
			Southern plateau	— 3.90	66
			Southern Pacific	— 4.60	66

EXCESSIVE PRECIPITATION.

The following table for December, 1894, shows, by States, the individual stations reporting total precipitation to equal or exceed 10.00 inches during this month, 2.50 in 24 hours, and 1.00 in 1 hour:

Excessive precipitation, by stations, for December, 1894.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Alabama.	*Inches.*	*Inches.*		*Inches*	*h. m.*	
Jasper		2.61	12			
Mobile				1.17	1 00	11
Oxanna		2.50	11-2			
Arkansas.						
Bee Branch		2.70	9			
California.						
Anderson	13.33					
Aptos	13.32					
Auburn	13.56					
Bear Valley	22.37	2.85	18			
Do		2.60	22			
Berkeley	12.63					
Bocs	11.80					
Boulder Creek	30.53					
Calistoga	15.39					
Cape Mendocino Lighthouse	17.80					
Chicago Park	17.20	2.60	5-6			
Chico	11.08					
Cisco	21.60					
Cloverdale	18.60	3.04	21			
Colfax	24.17					
Corning	10.85					
Crescent City	13.46					
Crescent City Lighthouse	14.30					
Deep Creek	18.41	3.32	5			
Do		6.09	19			
Do		3.17	29			
Delta	33.17					
Drytown	12.47					
Dunnigan	11.22					
Dunsmuir	15.80					
Durham	10.12					
Edmanton	24.00					
Eldorado	14.37					
Elmira	12.83					
El Verano	14.09					
Eureka	12.31	3.47	20-21			
Felton	24.14					
Folsom City a	11.68					
Folsom City b	11.74					
Fordyce Dam	38.41	7.08	6-7			
Do		8.50	17-19			
Do		6.90	21-22			
Georgetown	20.93	3.30	17-18			
Do		2.52	22			
Glendora		3.03	19			
Glen Ellen	19.91					
Gormans Station		2.78	24			
Grass Valley a	16.55					
Green Valley	21.64	4.82	5			
Do		8.91	19			
Do		4.44	29			
Greenville	13.39					
Haywards	10.40					
Healdsburg	16.32	3.00	21			
Hendersons Ranch		3.90	20			
Humboldt Lighthouse	13.86					
Hydesville	11.20					
Iowa Hill	17.57	2.54	18			
Jackson	15.50	2.79	17			

Excessive precipitation—Continued.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
California—Cont'd.	*Inches.*	*Inches.*		*Inches*	*h. m.*	
Kennedy Gold Mine	16.44					
Knights Landing	12.52					
Kono Tayee	10.70					
La Porte	15.47	2.50	17			
Laurel	24.91					
Lick Observatory	11.90					
Little Bear Valley	20.12	6.74	5-6			
Do		7.73	19			
Little Bear Valley (near)	24.59	8.95	5-6			
Do		6.64	19			
Do		2.95	29			
Los Gatos a	15.85					
Los Gatos b	17.77	2.70	17			
Do		3.70	21			
Lower Holcomb Valley	15.69	8.02	19-20			
Mariposa	13.36					
Martines	12.02					
Middletown	30.52	3.01	8-9			
Mills College	12.90					
Milton (near)	10.53					
Mokelumne Hill	14.31	3.23	17			
Morses House	26.77	10.52	5-7			
Do		8.02	19-20			
Mount Glenwood	16.04	2.59	8			
Nevada City	20.61					
New Almaden	10.83					
Newcastle a	12.50					
Niles	10.85					
Oakland a	11.78					
Oakland b	12.04					
Orangevale	10.48					
Oroville a	11.48					
Palermo	10.20					
Petaluma	10.15					
Placerville a	19.03					
Placerville b	18.49					
Point Arena Lighthouse	14.32					
Point Bonita Lighthouse	12.43					
Red Bluff (W. R.)	11.01					
Red Bluff (S. P. R. R.)	10.57					
Redding a	15.35					
Redding b	12.22					
Represa	12.56					
Rocklin	11.10					
Rosewood	12.63	3.46	21			
San Leandro	11.64					
San Luis Obispo (W. B)		2.86	28-29			
San Mateo	12.12					
San Rafael	17.06	3.19	9			
Santa Cruz a	12.89					
Santa Cruz b	13.71					
Santa Cruz Lighthouse	11.89					
Santa Margarita	10.82					
Santa Rosa	13.14					
Shasta Springs	21.47	3.75	20			
Shingle Springs	14.50					
Sisson	11.13					
Squirrel Inn	16.38	6.70	5-6			
Summerdale	17.29					
Sutter Creek	12.25					
Towles	13.88					
Truckee	13.95					
Tunnel No. 2	14.90	4.00	5-6			
Do		6.62	19-20			
Ukiah	15.47	3.03	21			
Upper Mattole	27.77	5.37	8-9			
Do		4.39	17			
Do		4.85	20-21			
Vacaville a	12.80					
Vacaville b	13.27					
Valley Springs	10.51					
Walnut Creek	10.04					
West Point	16.28	2.55	6			
Wheatland	10.75					
Winters	14.70					
Wire Bridge	13.31					
Woodland	10.69					
Yuba City	11.15					
Colorado.						
Ruby	11.81					
Florida.						
Plant City				1.17	1 00	11
Georgia.						
Adairsville		2.79	10-11			
Alapaha				2.10	1 00	13
Canton		2.55	11-12			
Clayton		2.67	10			
Columbus		3.14	10-11			
Dahlonega		2.57	10-11			
Diamond		3.10	12	1.07	0 20	11
Marietta		2.85	25-26			
Toccoa	11.11	5.50	11-12			
Indiana.						
Marengo		2.50	1			
Kentucky.						
Matlock		2.80	25-26			
Louisiana.						
Hammond		2.70	9			
Sugartown		2.84	9			
Maine.						
Belfast		2.68	27			

Excessive precipitation—Continued.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours. Amt.	Day.	Rainfall of 1 inch, or more, in one hour. Amt.	Time.	Day.
	Inches.	*Inches.*		*Inches.*	*h. m.*	
Massachusetts.						
Beverly Farms		2.84	26-27			
Boston (V.O.)		2.57	26-27			
Brockton *a*		2.59	26-27			
Brockton *b*		2.78	26-27			
Fall River		2.75	26-27			
Framingham		2.53	26-27			
Hingham		2.99	26-27			
Long Plain		3.03	26-27			
Mansfield		2.58	26-27			
Middleboro		2.78	26-27			
Milton		2.00	26-27			
Nantucket		2.62	26-27			
Natick		2.55	26-27			
New Bedford *a*		3.08	26-27			
New Bedford *b*		3.07	26-27			
Plymouth		3.53	26-27			
Roxbury		2.67	26-27			
Somerset		2.90	26-27			
Taunton *b*		3.15	26-27			
Taunton *c*		3.01	26-27			
Taunton *d*		3.26	26-27			
Vineyard Haven		2.89	27			
Missouri.						
Arthur		2.73	1			
Gordonville		2.56	1			
Hastain		3.25	1-2			
Ironton		2.75	1-2			
Linn Creek		3.50	1-2			
Mine La Motte		3.01	*			
Oak Ridge		3.00	1			
Wheatland		2.95	1			
New Jersey.						
Asbury Park		3.71	26-27			
Freehold		2.73	26-27			
Oceanic		3.16	26-27			
Salem		2.50	26-27			
Toms River		4.00	26-27			
North Carolina.						
Blowing Rock		4.65	10-11			
Flat Rock		3.23	11-12			
Highlands		2.70	10			
Horse Cove		5.67	10-11			
Lynn		4.05	11-12			
Marion		3.00	11			
Skyuka		3.07	12			
Oregon.						
Bandon	16.13					
Glenora	14.44	3.87	9			
Langlois	17.15	2.55	20			
Rhode Island.						
Block Island		2.52	27			
Bristol		2.72	26-27			
Providence *a*		2.50	26-27			
South Carolina.						
Central		3.00	11-12			
Tennessee.						
Clinton		2.50	11-12			
Washington.						
Index		2.74	11			
Neah Bay	11.98					
Tatoosh Island	11.75					

The following tables give a summary of the preceding table, and show the number of stations in each State reporting excessive precipitation during this month:

Monthly precipitation to equal or exceed 10.00 inches.

State.	Number of stations.	State.	Number of stations.
California	114	Washington	2
Oregon	3	Georgia	1

Daily precipitation to equal or exceed 2.50 in 24 hours.

State.	Number of stations.	Dates.	State.	Number of stations.	Dates.
California	35	5, 5-6, 5-7, 6, 6-7, 8, 8-9, 9, 17, 17-18, 17-19, 18, 19, 19-20, 20, 20-21, 21, 21-22, 24, 28-29, 29.	North Carolina	7	10, 10-11, 11, 11-12, 12.
			New Jersey	5	26-27.
Massachusetts	22	26-27, 27.	Rhode Island	3	26-27, 27.
Georgia	8	10, 10-11, 11-12, 12, 25-26.	Louisiana	2	9.
			Oregon	2	9, 20.
Missouri	8	Nov. 30-Dec. 1, 1-2.	Indiana	1	1.
			Kentucky	1	25-26.
			South Carolina	1	11-12.
			Washington	1	11.

Hourly precipitation to equal or exceed 1.00 inch.

State.	Number of stations.	Dates.	State.	Number of stations.	Dates.
Georgia	2	11, 12.	Florida	1	11.
Alabama	1	11.			

FREQUENCY OF EXCESSIVE PRECIPITATION.

The following tables show the frequency of excessive precipitation or the number of years for which monthly precipitation to equal or exceed 10.00 inches, daily precipitation to equal or exceed 2.50 inches, and hourly precipitation to equal or exceed 1.00 inch has been reported in the several States and Territories for December during the last twenty-five years:

Frequency of excessive monthly precipitation.

State.	No. years noted.	State.	No. years noted.
Washington	19	Colorado	2
California	16	Alabama	1
Oregon	13	Arizona	1
Texas	8	Indiana	1
North Carolina	6	Kentucky	1
Louisiana	6	Massachusetts	1
Florida	4	Michigan	1
Mississippi	3	Missouri	1
Arkansas	3	Nevada	1
Georgia	3	New Hampshire	1
New York	2	New Jersey	1
Tennessee	2	Virginia	1

Frequency of excessive daily precipitation.

California	17	Maryland	5
Louisiana	14	New York	5
North Carolina	13	Maine	4
Texas	13	New Jersey	4
Georgia	12	Missouri	3
Alabama	12	Kansas	3
Oregon	12	Michigan	2
Florida	11	Arizona	2
Tennessee	11	Iowa	2
Mississippi	11	District of Columbia	2
Washington	9	Colorado	1
Indiana	9	Connecticut	1
Virginia	8	New Hampshire	1
South Carolina	7	Utah	1
Kentucky	7	Vermont	1
Illinois	6	Delaware	1
Ohio	6	Indian Territory	1
Pennsylvania	6	Minnesota	1
Arkansas	6	Wisconsin	1
Massachusetts	6	Rhode Island	1

Frequency of excessive hourly precipitation.

Texas	8	Georgia	2
California	6	Florida	2
Louisiana	5	Kansas	1
Mississippi	4	Massachusetts	1
Tennessee	3	Maine	1
Arkansas	3	Missouri	1
Alabama	3	Oregon	1
Illinois	2	Virginia	1
Indiana	2	Washington	1
Pennsylvania	2	Wisconsin	1
Michigan	2		

EXCEPTIONAL PRECIPITATION.

The following tables give exceptionally heavy monthly, daily, and hourly precipitation reported for December during the last 25 years.

Exceptional monthly precipitation.

Station and state.	Amt.	Year.	Station and state.	Amt.	Year.
	Inches.			*Inches.*	
San Andreas, Cal	51.05	1871	Boulder Creek, Cal	30.53	1894
Pilarcitos, Cal	41.87	1871	Upper Mattole, Cal	29.30	1889
Fordyce Dam, Cal	38.41	1894	Mount St. Helena, Cal	28.91	1880
Felton, Cal	34.95	1889	Summit, Cal	28.88	1871
Mount Hamilton, Cal	33.84	1884	Cisco, Cal	28.30	1871
Delta, Cal	33.17	1894	Upper Mattole, Cal	27.77	1894
Reeds Camp, Cal	32.07	1880	Sims, Cal	26.92	1892
Laurel, Cal	31.79	1889	Morses House, Cal	26.77	1894
Emigrant Gap, Cal	31.20	1884	Crescent City, Cal	26.26	1885
Neah Bay, Wash	30.70	1886	Tatoosh Island, Wash	25.84	1886

Exceptional monthly precipitation—Continued.

Station and state.	Am't.	Year.	Station and state.	Am't.	Year.
	Inches.			*Inches.*	
Delta, Cal	25.83	1889	Pysht, Wash	21.61	1886
Cisco, Cal	25.57	1889	Cisco, Cal	21.60	1894
Do	25.05	1884	Shasta Springs, Cal	21.47	1894
Edmanton, Cal	24.98	1892	Fort Stevens, Oreg	21.27	1880
Laurel, Cal	24.91	1894	American Hill, Cal	21.22	1889
Little Bear Valley, Cal. (near)	24.59	1894	Boulder Creek, Cal	21.11	1892
Upper Mattole, Cal	24.48	1892	Grass Valley, Cal	21.08	1889
Mumford Hill, Cal	24.34	1880	Iowa Hill, Cal	21.04	1889
Colfax, Cal	24.17	1894	San Rafael, Cal	20.96	1884
Felton, Cal	24.14	1894	Georgetown, Cal	20.93	1894
Edmanton, Cal	24.00	1894	Emigrant Gap, Cal	20.85	1889
Neah Bay, Wash	23.91	1891	Los Gatos, Cal. a	20.73	1889
Colfax, Cal	23.60	1884	Nevada City, Cal	20.61	1894
Neah Bay, Wash	23.22	1880	Crescent City, Cal	20.58	1889
Georgetown, Cal	22.93	1889	Dunsmuir, Cal	20.58	1889
Grass Valley, Cal	22.69	1888	Middletown, Cal	20.58	1894
Laurel, Cal	22.66	1892	Healdsburg, Cal	20.42	1871
Neah Bay, Wash	22.57	1887	Point Pleasant, La	20.39	1884
Bear Valley, Cal	22.37	1894	Santa Cruz, Cal	20.38	1889
Do	22.09	1890	Portland, Oreg	20.14	1882
Vacaville, Cal	21.85	1880	Little Bear Valley, Cal	20.12	1894
Colfax, Cal	21.85	1880	Tatoosh Island, Wash	20.06	1891
Green Valley, Cal	21.64	1894	Cathlamet, Wash	20.00	1875

Exceptional daily precipitation.

Station and state.	Amount.	Date.	Station and state.	Amount.	Date.
	Inches.			*Inches.*	
Upper Mattole, Cal	16.93	22-24, 1892	Fouts Springs, Cal	6.44	22-24, 1892
Point Pleasant, La	13.50	19, 1882	Micco, Fla	6.33	24, 1888
Monroe, La	12.15	29-30, 1884	Bandon, Oreg	6.32	21-22, 1892
Edmanton, Cal	11.71	23-25, 1892	Fort Meade, Fla	6.20	17, 1888
San Rafael, Cal	11.45	17-21, 1884	Farmerville, La	6.15	5, 1890
Morses House, Cal	10.52	5-7, 1894	Dry Creek, Cal	6.09	19, 1894
Mount Ida, Ark	10.35	26-30, 1884	Gardiner, Oreg	6.07	20-21, 1892
Cloverdale, Cal	10.10	23-24, 1892	Minden, La	6.02	23, 1891
Morses House, Cal	9.75	27, 1893	Fayetteville, N. C	6.00	9-10, 1878
Mount St. Helena, Cal	9.04	23-24, 1880	Do	6.00	20-21, 1878
Little Bear Valley, Cal. (near)	8.95	5-6, 1891	Clarksville, Tex	6.00	*
Green Valley, Cal	8.91	19, 1894	Hydesville, Cal	6.00	22-23, 1892
Shasta Springs, Cal	8.75	22-24, 1892	Olympia, Wash	5.98	20-22, 1892
Clarksville, Tex	8.50	29-30, 1874	Hallettsville, Tex	5.93	11-12, 1891
Do	8.50	28-29, 1876	Mount St. Helena, Cal	5.73	19-20, 1880
Fordyce Dam, Cal	8.50	17-19, 1894	Louisville, Ill	5.70	3, 1873
Yaquina L. H., Oreg	8.47	5-6, 1887	Horse Cove, N. C	5.67	10-11, 1894
Los Gatos, Cal	8.46	23-24, 1892	New Ulm, Tex	5.62	3, 1875
Point Pleasant, La	8.03	28-30, 1884	Stuttgart, Ark	5.61	12-13, 1892
Lower Holcomb Valley, Cal	8.02	19-20, 1894	Toccoa, Ga	5.50	11-12, 1894
Morses House, Cal	8.02	19-20, 1894	Neah Bay, Wash	5.45	16-17, 1887
College Station, Tex	7.78	12-14, 1891	Fort Barrancas, Fla	5.43	5, 1879
Little Bear Valley, Cal	7.73	1-2, 1894	Merritts Island, Fla	5.39	17, 1888
Portland, Oreg	7.60	12-13, 1882	Upper Mattole, Cal	5.37	8-9, 1894
Middletown, Cal	7.57	23-24, 1892	Fort Barrancas, Fla	5.36	3-4, 1877
Pikes Peak, Colo	7.39	5-6, 1892	Searcy, Ark	5.33	12-13, 1892
Edmanton, Cal	7.08	2-3, 1892	Fort Barrancas, Fla	5.32	20, 1881
Fordyce Dam, Cal	7.08	6-7, 1894	Austin, Tex	5.31	11-12, 1891
Madding, Ark	7.06	12, 1892	Highlands, N. C	5.30	26, 1881
Point Pleasant, La	7.02	8-9, 1878	Titusville, Fla	5.28	17, 1888
Fordyce Dam, Cal	6.90	21-22, 1894	Trinity, Ala	5.20	4, 1887
Little Bear Valley, Cal	6.74	5-6, 1894	Squirrel Inn, Cal	5.18	27, 1893
Squirrel Inn, Cal	6.70	5-6, 1894	Nordhoff, Cal	5.17	23-25, 1892
New Gascony, Ark	6.66	12-13, 1892	Osceola, Ark	5.06	30-31, 1892
Mount St. Helena, Cal	6.65	2-3, 1880	Camden, Ala. b	5.05	12, 1892
Little Bear Valley, Cal. (near)	6.64	19, 1894	Vicksburg, Miss	5.05	18-19, 1872
Tunnel No. 2, Cal	6.62	19-20, 1894	Red Bluff, Cal	5.04	19, 1879
Fort Gaston, Cal	6.60	24-25, 1883	Boyds Corners, N. Y	5.02	17, 1878
Pine Bluff, Ark	6.60	12-13, 1892	Point Pleasant, La	5.01	14, 1884
			Ellsworth, Cal	5.00	1-2, 1880
			Melissa, Tex	5.00	27-28, 1877

* December 31, 1874 and January 1, 1875.

Exceptional precipitation for one hour or less.

Station and state.	Amount.	Time.	Date.
	Inches.	h. m.	
New Orleans, La	0.30	0 05	12, 1893
Tampa, Fla	0.30	0 05	26, 1892
New Orleans, La	0.30	0 05	5, 1890
Atlanta, Ga	0.27	0 05	3, 1893
Vicksburg, Miss	0.26	0 05	15, 1893
Jupiter, Fla. *	0.25	0 05	11, 1892
Norfolk, Va	0.25	0 05	4, 1891
Savannah, Ga	0.25	0 05	8, 1890
Galveston, Tex	0.20	0 05	24, 1890
Tampa, Fla	0.50	0 05	26, 1892
New Orleans, La	0.50	0 10	12, 1893
Galveston, Tex	1.36	0 20	28, 1871
Wellsboro, Pa	1.20	0 20	7, 1884
Diamond, Ga	1.07	0 20	11, 1894
Winnebago, Ill	1.00	0 20	21, 1889

* Record incomplete.

MAXIMUM RAINFALL FROM SELF-REGISTERING GAUGES.

The following table gives the heaviest rainfall during December, 1894, for periods of 5, 10, and 60 minutes, as recorded on self-registering rain gauges at regular stations of the Weather Bureau. This record refers strictly to rainfall. About 37 stations are furnished with self-registering-float rain gauges and 6 with the self-registering-weighing rain-and-snow gauge. The float gauge does not record snowfall, and both forms are liable to be interrupted by snow or ice:

Maximum rainfall in one hour or less.

Station.	Maximum rainfall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		*Inch.*		*Inch.*	
Atlanta, Ga. *	0.17	10	0.24	9	0.48	9
Baltimore, Md	0.19	12	0.15	12	0.34	12
Bismarck, N. Dak. †						
Boston, Mass	0.07	27	0.11	27	0.40	27
Buffalo, N. Y	0.06	8	0.06	8, 10	0.27	10
Chicago, Ill. *	0.02	10	0.04	10	0.12	10
Cincinnati, Ohio	0.05	1	0.08	1	0.30	1
Cleveland, Ohio *	0.03	12	0.06	12	0.23	12
Denver, Colo. *						
Detroit, Mich	0.02	8, 10	0.04	10	0.13	8
Dodge City, Kans. *						
Duluth, Minn. *	0.03	8	0.06	8	0.23	8
Eastport, Me. *	0.06	27	0.08	27	0.13	12
Galveston, Tex	0.06	3	0.12	3	0.21	3
Indianapolis, Ind	0.07	8	0.10	8	0.24	1
Jacksonville, Fla	0.09	26	0.11	26	0.22	26
Jupiter, Fla	0.09	6	0.12	6	0.33	6
Kansas City, Mo	0.05	10	0.07	10	0.15	10
Key West, Fla	0.02	12	0.04	12	0.13	12
Little Rock, Ark	0.22	2	0.27	2	0.85	9
Louisville, Ky	0.16	8	0.25	8	0.33	8
Memphis, Tenn. *	0.05	2, 9	0.10	2	0.45	2
Nantucket, Mass	0.20	27	0.37	27	0.65	27
Nashville, Tenn	0.07	8	0.09	8, 10	0.24	8, 26
New Orleans, La. *						
New York, N. Y	0.12	12	0.13	12	0.44	12
Norfolk, Va	0.14	10	0.18	10	0.31	10
Philadelphia, Pa	0.05	12	0.10	12	0.24	12
Pittsburg, Pa. *						
Portland, Me. *	0.02	12, 27	0.04	12, 27	0.12	28
Portland, Oreg	0.02	9	0.04	9	0.11	5
St. Louis, Mo. *						
St. Paul, Minn	0.10	16	0.11	16	0.21	15
Salt Lake City, Utah *						
San Diego, Cal	0.10	8	0.12	8	0.28	8
San Francisco, Cal	0.12	7	0.19	7	0.40	7
Savannah, Ga. *	0.01	26	0.02	26	0.09	26
Seattle, Wash	0.04	5	0.06	5	0.15	5
Vicksburg, Miss	0.24	9	0.28	11	0.86	11
Washington, D. C	0.21	12	0.26	12	0.40	12
Wilmington, N. C	0.01	4	0.02	4	0.06	4

* Record incomplete. † Less than 0.05 in 1 hour.

MONTHLY SNOWFALL.

The depth of snow that fell during the month of December, as reported by both regular and voluntary observers, is shown in detail, for stations reporting 10 inches or more, in the following table. The monthly snowfall and the limit of freezing weather are also shown on Chart VI.

DEPTH OF SNOW ON GROUND.

The depth of unmelted snow lying on the ground at 8 p. m. of the the 15th and 31st is shown in the following table, for stations reporting 10 inches of monthly snowfall. The amount on the ground on the 31st is also shown on Chart VII.

Monthly snowfall and amounts on ground on the 15th and at close of month.

State and station.	Total.	15th.	31st.	State and station.	Total.	15th.	31st.
Alabama.	*Inches.*	*Ins.*	*Ins.*	*California*—Cont'd.	*Inches.*	*Ins.*	*Ins.*
Oxanna	10.0	0.0	5.0	Greenville	66.0	12.0	19.0
Arizona.				La Porte	152.0	42.0	84.0
Flagstaff	38.0	.....	.....	Little Bear Val. (near)	13.4	.....	.....
Arkansas.				Ormonde	36.0	.....	0.0
Rogers	10.0	0.0	0.0	Pilot Creek	87.0	32.0	36.0
California.				Shasta Springs	97.6	31.0	38.0
Adin	30.2	6.0	3.0	Sisson	95.0	.....	.....
Bear Valley	155.5	38.0	66.0	Summerdale	57.0	.....	.....
Boca	118.0	.....	.....	Summit	245.0	.....	.....
Cedarville	17.3	4.0	7.5	Susanville	53.5	.....	.....
Cisco	216.0	.....	.....	Truckee	139.5	.....	.....
Dunsmuir	150.0	.....	.....	*Colorado.*			
Edgewood	20.0	.....	.....	Boulder	12.3	0.0	8.1
Edmanton	168.0	50.0	90.0	Box Elder	19.5	5.0	3.0
Fordyce Dam	458.0	65.0	129.0	Breckenridge	29.6	4.0	12.0
Green Valley	20.0	.....	.....	Canyon	10.0	0.0	2.0

Monthly snowfall and amounts on ground, etc.—Continued.

State and station.	Total.	15th.	31st.
Colorado—Cont'd.	*Inches.*	*Ins.*	*Ins.*
Castle Rock	31.0	.....	1.5
Climax	39.0	.....	.....
Collbran	21.0	8.0	6.0
Craig	16.8	8.0	9.0
Denver	10.5	0.0	3.2
Divide Ex. Station	11.0	0.0	4.0
Durango	30.0	4.0	4.0
Gold Hill	14.6	4.0	6.0
Hotchkiss	20.5	.....	4.2
Laporte	11.4	.....	.....
Las Animas	11.5	.....	.....
Lay	16.0	4.5	6.0
Meeker	13.5	.....	2.8
Moraine	17.8	.....	5.0
Ouray	33.0	5.0	6.0
Pagoda (near)	27.5	12.0	10.0
Paonia	16.5	3.0	5.0
Parachute	20.0	5.0	8.0
Redcliff	24.0	10.0	10.0
Rico	51.3	.....	.....
Ruby	119.0	48.0	60.0
St. Cloud	20.0	.....	8.0
San Juan	19.5	9.0	8.0
Santa Clara	14.0	.....	.....
Scissors	16.0	2.0	4.0
Smoky Hill Mine	16.0	.....	8.0
Spring Gulch	14.9	6.0	7.0
Stamford	21.5	5.0	.....
Surface Creek	28.0	3.0	3.0
T. S. Ranch	10.0	.....	.....
Connecticut.			
Canton	18.0	2.0	7.0
Falls Village	16.0	1.0	6.0
Hartford *b*	11.5	1.0	5.0
N. Grosvenor Dale	21.0	.....	.....
Southington	13.0	.....	.....
South Manchester	10.0	2.0	5.0
Storrs	17.0	T.	4.0
West Simsbury	18.0	4.0	6.0
Windsor	15.3	3.1	5.2
Idaho.			
Atlanta	24.0	12.0	15.0
Chesterfield	11.0	7.0	6.0
Garden Valley	25.7	.....	.....
Grangeville	20.4	2.0	4.0
Hailey	18.6	.....	.....
Idaho City	40.2	.....	.....
Kootenai	42.0	24.0	12.0
Lake	30.0	.....	.....
Lucas	41.7	.....	.....
Martin	19.5	18.0	20.0
Murray	52.0	12.0	18.0
Paris	16.5	8.0	9.0
Salubria	23.5	8.3	12.5
Illinois.			
Chicago	10.1	0.0	5.7
Indiana.			
Hammond	13.2	.....	12.9
Madison	12.0	.....	7.0
Vevay	12.0	.....	8.0
Kansas.			
Ellinwood	10.8	.....	.....
Garden City	10.0	4.0	2.0
Hutchinson	12.0	0.0	5.0
Ness City	12.0	.....	.....
Pleasant Dale	12.0	T.	4.0
Kentucky.			
Alpha	12.0	0.0	2.0
Caddo	13.0	.....	12.0
Canton	11.0	.....	4.0
Carrollton	12.0	.....	12.0
Catlettsburg	11.0	.....	7.0
Earlington	12.0	.....	8.0
Eddyville	10.0	.....	7.0
Falmouth	10.0	.....	.....
Fords Ferry	15.0	.....	4.0
Harrodsburg	11.3	.....	7.0
Henderson	10.0	.....	.....
Louisville	10.5	0.0	9.9
Mount Sterling	12.5	.....	.....
Paducah *a*	12.0	0.0	2.5
Paducah *b*	10.0	.....	5.0
Shelbyville	13.0	.....	13.0
Springfield	10.0	.....	.....
Maine.			
Belfast	13.0	.....	7.0
Calais	10.5	.....	5.0
Cornish	20.0	.....	12.0
Fairfield	14.8	0.0	9.0
Farmington	20.0	T.	10.0
Gardiner	12.2	.....	7.0
Houlton	19.5	T.	12.0
Indian Stream	17.5	T.	12.0
Lewiston	21.2	T.	.....
Madison	18.5	3.0	12.0
Orono	10.9	0.0	9.5
Portland	11.7	0.0	8.4
Maryland.			
Boettcherville	12.0	0.0	10.0
Cumberland *a*	12.0	0.0	12.0
Deer Park	13.0	.....	.....
Grantsville	15.0	0.0	15.0
Oakland	22.0	.....	18.0
Sunnyside	17.0	0.0	16.0
Taneytown	10.0	0.0	6.0
Western Port	10.0	.....	.....
Massachusetts.			
Adams	24.0	.....	8.0
Amherst	18.0	.....	.....
Amherst Ex. Station *a*	22.0	0.0	7.0
Amherst Ex. Station *b*	21.0	.....	6.0
Andover	22.0	.....	7.0
Bedford	14.5	T.	9.0
Beverly Farms	15.0	T.	4.0
Blue Hill (summit)	18.1	T.	4.0
Boston	13.5	0.0	3.0
Brockton *a*	10.1	0.0	2.0
Chestnut Hill	13.5	0.0	4.0
Concord	23.2	1.0	10.8
Dudley	25.0	0.0	12.0
East Templeton	19.0	3.5	7.0
Fall River	10.5	0.0	0.5
Fiskdale	21.0	.....	.....
Fitchburg *a*	17.0	.....	6.0
Fitchburg *b*	18.8	2.0	7.0
Framingham	18.0	.....	.....
Gilbertville	12.0	T.	.....
Groton	22.0	T.	10.0
Hingham	10.5	.....	.....
Hobbs Brook	18.2	.....	7.0
Lawrence	19.0	2.0	10.0
Leeds	26.0	3.0	12.0
Leominster	15.0	T.	4.5
Ludlow Center	16.0	.....	.....
Mansfield	15.8	T.	2.0
Milton	12.0	.....	.....
Monroe	31.0	6.0	12.0
Mount Nonotuck	19.5	5.0	8.0
Natick	20.0	T.	6.0
North Billerica	25.0	6.0	6.0
Randolph	11.0	T.	2.0
Roberts Dam	20.0	.....	.....
Roxbury	16.7	0.0	5.0
Salem	15.0	.....	.....
Salisbury	20.0	0.0	6.0
Somerset	14.0	0.0	T.
Springfield Armory	17.0	.....	.....
Taunton *b*	13.5	0.0	2.0
Wakefield	20.0	1.0	8.0
Webster	19.0	2.0	7.0
Westboro	19.5	8.0	12.0
Williamstown	16.0	.....	.....
Winchendon	19.5	4.0	8.0
Winthrop	12.5	0.0	.....
Michigan.			
Calumet	18.7	3.0	7.5
Charlevoix	14.0	.....	.....
Lathrop	10.0	6.0	8.0
Marquette	16.6	3.1	8.3
Northport	16.0	1.0	10.0
Sault Ste. Marie	14.0	1.4	8.3
Montana.			
Cokedale	15.0	.....	.....
Columbia Falls	18.0	T.	9.0
Fort Missoula	12.0	.....	.....
Hogan	11.0	T.	10.0
Kipp	11.0	.....	.....
Troy	21.6	.....	.....
Nevada.			
Austin	26.0	.....	.....
Battle Mountain	11.5	3.0	2.0
Belmont	20.2	8.0	6.0
Beowawe	12.0	.....	.....
Carlin	18.1	.....	.....
Carson City (W. B.)	24.8	1.2	5.5
Carson City (V. O.)	22.2	1.2	5.5
Clover Valley	18.0	2.0	6.0
Cortez	31.0	8.0	9.0
Elko	15.0	.....	.....
Elko (near)	32.4	18.0	14.0
Ely	21.0	.....	.....
Genoa	24.0	2.0	6.1
Goiconda	10.0	.....	.....
Gold Hill	39.5	4.0	5.0
Halleck	20.2	7.0	10.0
Lewers Ranch	45.4	14.0	18.0
Marlette Lake	73.8	14.0	40.0
Osceola	24.7	10.0	5.0
Palisade	21.0	1.0	3.5
Palmetto	31.0	8.0	6.0
Paradise Valley	21.0	2.2	9.0
Reno	23.5	.....	.....
Reno State University	14.3	0.0	2.8
Ruby Valley	16.8	5.0	5.0
Stofiel	21.5	5.0	4.0
Tecoma	13.0	.....	.....
Toano	34.5	.....	.....
Tybo	19.0	8.0	10.0
Verdi	52.0	.....	.....
Virginia City	27.1	.....	.....
Winnemucca (W. B.)	21.1	5.3	6.5
Winnemucca (V. O.)	20.0	.....	.....
New Hampshire.			
Alstead	18.0	2.0	.....
Berlin Mills	29.0	4.0	16.0
Bethlehem	15.0	1.0	7.0
Brookline	17.8	2.0	9.0
Concord	20.0	T.	9.0
Dublin	24.0	T.	12.0
Hanover	19.5	0.0	10.0
Keene	16.5	T.	7.0
Lancaster	22.5	1.0	12.0
Littleton	14.8	2.0	7.0
Nashua	21.0	T.	9.0
Newton	18.0	.....	.....
North Conway	18.0	.....	.....
Peterboro	19.7	4.0	8.0
Plymouth	13.5	2.0	6.0
Sanbornton	12.0	T.	6.5
Stratford	20.0	2.0	6.0
West Milan	29.9	7.0	18.0
New Jersey.			
Elisabeth	12.0	0.0	8.0
New Mexico.			
Chama	25.0	6.0	12.0
Pecos	17.0	.....	.....
Rosa	13.0	3.0	.....
New York.			
Addison	20.0	0.0	19.0
Albany	24.4	0.0	12.4
Alfred Center	21.2	0.0	17.0
Angelica	16.5	0.0	12.0
Arcade	10.3	0.0	7.0
Baldwinsville	19.0	0.0	18.0
Binghamton	20.1	0.0	18.0
Brookfield	18.0	0.0	15.0
Canton	10.5	.....	.....
Cooperstown	12.5	0.0	10.0
Eden Center	25.0	.....	.....
Fleming	25.0	0.0	21.0
Friendship	12.4	0.0	12.0
Glens Falls	23.2	0.0	12.0
Gloversville	20.8	.....	6.0
Hamilton	19.5	0.0	10.0
Honeymead Brook	17.1	0.0	8.0
Humphrey	14.9	0.0	12.0
Ithaca	19.6	0.0	12.0
Lebanon Springs	21.0	T.	10.0
Le Roy	23.0	0.0	12.0
Lowville	20.5	0.0	16.0
Madison Barracks	29.8	.....	.....
Malone	26.7	0.0	15.8
Marlboro	13.0	0.0	6.0
New Lisbon	15.2	0.0	10.0
North Hammond	20.0	0.0	20.0
Number Four	24.4	3.0	15.0
Ogdensburg	15.0	.....	7.0
Oneonta	16.0	.....	.....
Oswego	19.9	0.0	15.5
Oxford	17.7	.....	.....
Palermo	17.8	0.0	12.0
Perry City	26.0	0.0	21.0
Plattsburg Barracks	23.2	.....	.....
Port Jervis	14.0	0.0	12.0
Potsdam	19.0	.....	.....
Romulus	23.5	.....	.....
Saranac Lake	28.0	3.0	15.0
South Canisteo	28.2	0.0	20.0
Stillwater	18.0	.....	8.0
Turin	19.7	2.0	3.0
Varysburg	13.4	.....	.....
Wappingers Falls	16.0	T.	12.0
Watertown	.....	0.0	24.0
Waverly	18.6	0.0	16.0
Wedgwood	25.0	0.0	22.0
West Chazy	18.0	.....	.....
North Carolina.			
Bakersville	10.0	.....	.....
Ohio.			
Annapolis	16.0	0.0	15.0
Athens	10.0	.....	.....
Coalton	11.0	0.0	9.0
Demos	10.5	0.0	10.0
Guysville	11.0	.....	.....
Hillhouse	15.0	0.0	9.0
Lowell	10.0	.....	.....
McArthur	10.0	.....	8.0
New Alexandria	22.0	.....	16.0
New Waterford	11.0	0.0	8.0
Pomeroy	10.0	.....	6.0
Ridge	10.0	0.0	10.0
Thurman	12.0	0.0	12.0
Warsaw	18.0	.....	.....
Youngstown	11.5	.....	10.0
Oregon.			
Baker City	13.6	3.0	3.3
Burns	12.0	.....	.....
Detroit	24.0	6.0	5.0
Hood River (near)	23.0	4.0	0.5
Joseph	18.0	3.0	6.0
Lakeview	34.5	.....	.....
Lone Rock	12.0	.....	3.0
Siskiyou	84.5	.....	.....
Sparta	27.5	7.0	12.0
Pennsylvania.			
Aqueduct	13.0	0.0	11.0
Blooming Grove	12.0	.....	10.0
Brookville	16.0	0.0	16.0
Carlisle *a*	14.0	.....	10.0
Cassandra	17.0	0.0	17.0
Clarion	13.4	0.0	9.0
Confluence	23.0	0.0	16.0
Davis Island Dam	13.0	0.0	12.0
Dubois	19.8	.....	.....
Dyberry	18.5	2.0	12.0
Emporium	19.4	0.0	12.0
Freeport	11.6	0.0	11.0
Girardville	15.8	.....	.....
Grampian	19.0	0.0	8.0
Greensboro	13.0	0.0	13.0
Hollidaysburg	13.0	0.0	10.0
Honesdale	21.5	0.0	11.5
Huntingdon	16.5	.....	7.0
Johnstown	15.0	0.0	12.0
Kilmer	15.5	.....	12.0
Le Roy	16.5	0.0	14.5
Lewisburg	20.0	.....	.....
Lock Haven	21.0	.....	.....
Lock No. 4	11.0	0.0	8.0
Mahoning	14.0	0.0	7.0
Parker	13.0	0.0	13.0
Pittsburg	13.1	0.0	8.0
Ridgway	18.0	.....	.....
Salem Corners	16.0	0.0	10.0
Saltsburg	15.0	0.0	10.0
Selinsgrove	18.0	0.0	18.0
Shinglehouse	22.5	0.0	20.0
Smethport	18.0	.....	.....
Somerset	22.0	.....	15.0
South Eaton	15.0	0.0	15.0
State College	12.2	0.0	11.0
Stoyestown	17.0	.....	.....
Towanda	16.5	0.0	14.0
Uniontown	15.0	.....	.....
Warren	12.2	0.0	12.0
Wellsboro	18.5	0.0	18.0
West Newton	17.6	0.0	12.0
Wilkesbarre	19.0	2.0	15.0
Rhode Island.			
Bristol	11.5	0.0	0.0
Lonsdale	15.0	.....	4.0
Pawtucket	14.2	0.0	3.0
Providence *a*	11.0	.....	.....
Providence *c*	11.0	0.0	.....
Utah.			
Castle Gate	17.0	.....	.....
Coalville	13.5	.....	.....
Emery	37.0	.....	34.0
Glendale	20.0	.....	.....
Heber	24.0	12.0	10.0
Lake Station	12.5	5.0	4.0
Levan	22.0	3.0	10.0
Logan	16.1	.....	.....
Manti	16.0	1.0	4.0
Mount Pleasant	18.5	.....	.....
Ogden *a*	11.0	.....	.....
Parowan	16.2	0.0	3.0
Promontory	10.2	.....	.....
Provo City	17.0	.....	.....
Salt Lake City	10.0	2.2	3.5
Santaquin	29.0	.....	.....
Scipio	20.0	.....	.....
Snowville	12.0	1.0	4.0
Soldier Summit	41.0	20.0	41.0
Thistle	35.3	.....	.....
Vermont.			
Brattleboro	25.2	.....	.....
Burlington	27.0	3.0	15.0
Cornwall	20.0	0.0	10.0
Enosburg Falls	17.0	.....	.....
Hartland	22.5	3.0	9.0
Irasburg	40.0	.....	14.0
Jacksonville	26.7	6.0	16.0
Northfield	28.0	T.	13.4
Norwich	21.0	.....	8.0
St. Johnsbury	18.5	3.0	7.5
Simonsville	22.0	.....	.....
Strafford	26.0	6.0	12.0
Wells	16.0	.....	8.0
Woodstock	24.5	3.0	10.0
Virginia.			
Monterey	12.0	0.0	10.0
Washington.			
Bridgeport	20.0	20.0	10.0
Cascade Tunnel	91.0	43.0	40.0
Conconully	24.0	14.0	16.0
Ellensburg	10.4	.....	.....
Ellensburg (near)	12.0	5.0	4.0
Fort Simcoe	28.0	6.0	2.0
Fort Spokane	16.0	6.0	4.0
Hunters	19.6	8.0	11.5
Lakeside	16.0	9.0	8.0
Moxee Valley	28.4	3.4	3.5
Spokane	11.0	T.	1.4
Stampede	59.5	35.0	20.0
Waterville	31.0	15.0	13.0
Wenatchee Lake	24.0	15.0	.....
West Virginia.			
Beverly	19.0	0.0	12.0
Bloomery	12.0	.....	10.0
Buchanan *a*	17.2	.....	.....
Burlington	10.0	0.0	10.0
Central Station	14.0	0.0	10.0
Charleston	10.0	.....	.....
Elkhorn	11.0	.....	6.0
Ella	12.5	0.0	12.5
Fairmount	14.0	0.0	12.0
Forest Hill	10.0	0.0	6.0
Glenville	18.1	.....	12.0
Grafton	18.5	0.0	10.5
Hinton	13.0	0.0	6.0
Lake	13.3	0.0	8.0
Leachtown	14.1	.....	8.0
Morgantown *a*	11.0	0.0	13.0
Morgantown *b*	17.0	.....	15.0
New Cumberland	10.0	.....	5.2
New Martinsville	11.0	.....	7.0
Parkersburg	10.1	0.0	6.0
Phillipi	18.0	0.0	13.0
Pleasant Hill	24.0	.....	20.0
Point Pleasant	10.0	0.0	8.0
Powellton	12.0	.....	8.0

Monthly snowfall and amounts on ground, etc.—Continued.

State and station.	Total.	15th.	31st.	State and station.	Total.	15th.	31st.
W. Virginia—Cont'd.	*Inches.*	*Ins.*	*Ins.*	*W. Virginia*—Cont'd.	*Inches.*	*Ins.*	*Ins.*
Raleigh	11.0	.....	9.0	Wheeling a	11.5	0.0	6.0
Rowlesburg	19.0	.....	.....	Wheeling b	10.0	.....	8.0
Sandyville	13.0	.....	10.0	*Wisconsin.*			
Spencer	16.0	0.0	16.0	Amherst	13.5	.....	.....
Tannery	20.0	0.0	20.0	*Wyoming.*			
Weston a	20.0	0.0	2.0	Fort Yellowstone	13.1	.....	.....
Weston b	18.0	.....	8.0				

SLEET.

The following are the dates on which sleet fell in the respective States:

Alabama, 30. Arizona, 27, 28. Arkansas, 1, 26, 30, 31. California, 6, 7. Colorado, 1, 10, 20, 22, 23. Connecticut, 1, 2, 8, 9, 11, 12, 17, 26, 27. Delaware, 26. Georgia, 4, 30, 31. Idaho, 6, 19, 20, 31. Illinois, 3. Indiana, 12, 24. Iowa, 9, 10, 11, 24. Kansas, 10, 11. Kentucky, 25, 26. Louisiana, 25, 26, 30. Maine, 12, 17, 27, 30. Maryland, 10, 24, 26. Massachusetts, 1, 2, 8 to 11, 24, 27. Michigan, 1, 11, 12, 24, 29. Minnesota, 1, 8, 10, 15, 16, 21, 23, 24. Mississippi, 26, 27, 29, 30. Missouri, 1, 10, 11, 23. Montana, 20. Nebraska, 9, 10, 11. Nevada, 5, 6. New Hampshire, 11, 27. New Jersey, 1, 6, 10, 11, 24 to 27. New Mexico, 7, 8, 28. New York, 1, 2, 10 to 13, 17, 22, 25, 26, 27. North Carolina, 5, 26, 27, 28, 29, 31. North Dakota, 7, 8, 23. Ohio, 10, 12, 21, 25, 27. Oregon, 1, 5, 6, 10, 11, 14, 16, 24, 25, 26, 29, 30. Pennsylvania, 1, 2, 9 to 12, 24 to 27. Rhode Island, 1, 9, 11, 28. South Carolina, 7, 8, 26, 28, 30, 31. South Dakota, 8, 24, 26, 31. Tennessee, 3, 26, 27. Texas, 31. Utah, 6, 9, 20. Vermont, 11, 27. Virginia, 4, 26, 27, 29. Washington, 5 to 8, 10, 14, 17, 22. West Virginia, 10, 23, 26, 27. Wisconsin, 11, 24.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 10, 11. Arkansas, 9. California, 6, 9, 19, 21. Georgia, 11, 17. Illinois and Indiana, 8. Louisiana, 3, 9, 10. Mississippi, 10, 11. Missouri, 8, 24. North Carolina, 26. Ohio, 8. Oregon, 7, 18. South Carolina, 12. Tennessee, 11. Texas, 9, 10. Washington, 6.

WIND.

PREVAILING DIRECTIONS.

The prevailing winds for December, 1894, viz, those that were recorded most frequently at Weather Bureau stations, are shown in Tables I and VIII; they are not given on Chart II, as has hitherto been the custom, but the resultant winds are published instead.

RESULTANT WINDS.

The resultant winds for the current month, as deduced from the hourly readings of self-registers at about 67 regular Weather Bureau stations, are given in Table VIII. Other resultants, deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table IX. These latter resultants are also shown graphically on Chart II, in connection with the isobars based on the same system of simultaneous observation; the small figure attached to each arrow shows the number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a wind of average velocity; these figures (or the ratio between them and the total number of observations in this month) indicate the extent to which winds from different directions counterbalanced each other. The original north, south, east, and west components are given in detail in Table IX.

During December the resultant movement was generally from the northwest in New England, northwest in the middle and south Atlantic States, southwest in the Ohio Valley and Tennessee and southern Rocky Mountain slope, northeast in the Gulf States, and southeast in the north Pacific coast region.

HIGH WINDS.

Maximum wind velocities of 50 miles, or more, per hour were reported at regular stations of the Weather Bureau as follows (maximum velocities are averages for five minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles.				*Miles.*	
Amarillo, Tex.	7	56	w.	Buffalo, N. Y	12	50	w.
Do	10	54	nw.	Cheyenne, Wyo	20	72	w.
Do	15	58	sw.	Chicago, Ill	16	60	sw.
Block Island, R. I	26	62	e.	Eastport, Me	27	60	ne.
Do	27	68	e.	El Paso, Tex	10	54	nw.
Boston, Mass	27	50	ne.	Erie, Pa	10	51	se.

Wind velocities of 50 miles, or more—Continued.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles.				*Miles.*	
Fort Canby, Wash.	5	59	se.	Portland, Oreg.	7	54	sw.
Do	6	50	se.	Do	8	50	s.
Do	7	65	e.	Rapid City, S. Dak.	20	56	sw.
Do	8	56	e.	Sacramento, Cal.	9	60	se.
Do	9	62	s.	Tatoosh Island, Wash.	7	76	e.
Do	10	62	se.	Do	8	56	sw.
Do	11	77	se.	Do	9	60	se.
Do	16	56	se.	Do	10	50	s.
Do	20	62	e.	Do	11	52	s.
Do	29	58	se.	Do	29	55	e.
Hatteras, N. C.	29	54	nw.	Winnemucca, Nev.	20	56	sw.
Huron, S. Dak.	20	58	sw.	Woods Holl, Mass	13	50	sw.
Independence, Cal.	9	52	w.	Do	27	72	sw.
Lander, Wyo.	20	60	sw.				

LOCAL STORMS.

Destructive or severe local storms were reported as follows:

6th.—San Francisco, Cal., thunderstorm.

7th.—Napa, Cal., windstorm.

8th.—Fox Creek, Mo., hailstorm.

9th.—Seattle, Wash., Astoria, Oreg., and Sacramento, Cal., windstorms.

10th.—Erie, Pa., windstorm. Near Richland, Ga., windstorm. Kingston, Ga., thunderstorm; ten persons injured. Westville, Fla., severe windstorm, funnel-shaped cloud; several persons badly injured. Summerfield, La., and Omega, La., thunderstorms. White Castle, La., severe windstorm; one person killed and about ten injured.

11th.—Berkeley, Cal., windstorm.

12th.—Forsyth and Reynolds, Ga., thunderstorms.

19th.—Heber, Utah, windstorm.

20th.—Cross, S. Dak., and Fort Laramie, Wyo., windstorms.

WIND SIGNALS FOR DECEMBER.

As it seems improper to assign the necessity for a high wind signal to the presence of an area of low pressure when there is an equally important area of high pressure adjacent, the Editor has transferred the enumeration of the wind signals from the sections on high and low areas to the present section on "Wind."

In the following list the hours at which the respective signals were hoisted are given in each case, using seventy-fifth meridian time uniformly:

2d, 11 a. m., westerly, information, Lakes Huron and Michigan, Sault Ste. Marie section, Marquette section, and Houghton section; 10.50 p. m., northwest, storm, Sandy Hook to Eastport.

3d, 11.50 a. m., west, information, Buffalo.

4th, 5.20 p. m., westerly, information, Lakes Superior, Michigan, and Huron.

6th, 10.10 a. m., southeast, storm, Lakes Michigan and Superior, except easterly, information, Duluth; 5.30 p. m., easterly, information, Lake Huron; 11 p. m., easterly information, Lake Erie.

7th, 10 a. m., east, information, Lake Michigan.

8th, 7.30 p. m., southwest, storm, Lake Erie; 11 p. m., storm, southwest, Lakes Ontario and Erie, except Erie and section; 11 p. m., information, Sandy Hook to Eastport.

9th, 7.40 a. m., Buffalo, changed to storm, northwest.

10th, 9.55 a. m., storm, northeast, Detroit; 10.20 a. m., storm, northeast, Milwaukee, Chicago, Grand Haven, Ludington, and Manistee; 10.30 a. m., northeast, Narragansett section and Woods Holl section; 11.30 a. m., storm, southeast, Lakes Erie and Ontario; 4.15 p. m., storm, northeast, New York to Boston, except Narragansett and Woods Holl sections; 4.15 p. m., southeast, storm, Sandy Hook to Norfolk section.

11th, 11 a. m., northeast, storm, Sandy Hook to Boston; 11.15 a. m., continued southeast, storm, on Lakes Erie and Ontario; continued northeast, storm, Narragansett and Woods Holl section.

12th, 11.15 a. m., continued storm, southeast, on Lakes Erie and Ontario; 11.15 a. m., continued northeast, storm, Narragansett and Woods Holl section; 1 p. m., changed to storm, northwest, Lake Erie; 3 p. m., changed to storm, northwest, Lake Ontario; 11 p. m., changed to storm, northwest, Sandy Hook to Boston section.

13th, 11.15 a. m., storm, northwest, Portland and Eastport; 1 p. m., continued storm, northwest, Buffalo.

14th, noon, changed to storm, southwest, Buffalo.

15th, 10 p. m., storm, southeast, Chicago, Milwaukee, Grand Haven, Manistee, and Ludington.

16th, 10.30 a. m., changed to storm, northwest, Chicago, Milwaukee, Grand Haven, Manistee, and Ludington; 11 p. m., storm, southwest, Breakwater to Eastport.

20th, 10 p. m., storm, southwest, Chicago, Milwaukee, Grand Haven, Manistee, and Ludington.

21st, 10 a. m., changed to storm, northwest, Chicago, Milwaukee, Grand Haven, Manistee, and Ludington.

24th, 11.30 p. m., storm, southeast, Woods Holl section to Eastport; 11.40 p. m., storm, southeast, Narragansett section.

26th, 11.20 a. m., storm, northwest, Port Eads, New Orleans, Mobile, Pensacola, and Jacksonville section to Washington, N. C.; 11 p. m., storm, northeast, Norfolk section to Woods Holl section.

27th, 10 a. m., storm, northwest, Lake Michigan; storm, northeast, Portland and Eastport; 11.30 a. m., changed to storm, northwest, New Haven to Woods Holl section and New York to Norfolk section; 10 p. m., changed to storm, northwest, Boston to Eastport; 11.20 p. m., storm, northwest, Galveston.

28th, 11 a. m., storm, northwest, Port Eads to Pensacola; 10.20 p. m., storm, northwest, Cedar Keys to Sandy Hook.

29th, 5.30 p. m., storm, northwest, Narragansett section.

ATMOSPHERIC ELECTRICITY.

GENERAL STATISTICS.

The table showing in detail for December, 1894, the statistics relative to auroras and thunderstorms is placed among the meteorological tables as No. XI, instead of being given in the text as heretofore. It shows the number of stations from which meteorologic reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month.

THUNDERSTORMS.

A mention of the more severe thunderstorms reported during the month is made under "Local storms." The dates on which reports of thunderstorms were most numerous were: 1st, 20; 8th, 73; 9th, 31; 10th, 38; 11th, 67; 12th, 66.

The States where thunderstorm reports were most numerous were: Alabama, Florida, Georgia, Louisiana, Missouri, North Carolina, and Ohio.

The States where the dates of thunderstorms were most frequent were: Louisiana, where they were recorded on eight days; Missouri, eight days; North Carolina, six days.

AURORAS.

The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four days preceding and following the date of full moon, viz, from the 8th to the 16th, inclusive. On the remaining twenty-two days of this month 35 reports were received, or an average of about one per day. The dates on which the reported number especially exceeded this average were: 15th, 3; 18th, 3; 21st, 3. The States from which auroras were reported by a large percentage of observers were: Indiana and North Dakota.

The States where the dates of auroras were most frequent were: Wisconsin, 7; North Dakota, 6; Indiana, 5.

Canadian data.—December, 1894.

Stations.	Dates of thunderstorm.	Dates of auroras.
Quebec, Que		6, 27
Toronto, Ont		15
Minnedosa, Man		6, 21, 22
Medicine Hat, Assin.		9, 10
Edmonton, Alberta		4, 7, 13

DAMAGE BY LIGHTNING.

No reports have been received of damage done by lightning during December.

METEOROLOGY AND MAGNETISM.

The movements of our atmosphere are to be studied primarily as problems in the mechanics and thermodynamics of moving gases and vapors, but our knowledge of the empirical relations between atmospheric phenomena and terrestrial magnetism has been elucidated by a few special students, and further study in this direction has been recognized by the Chief of the Weather Bureau as proper and desirable. As the subject of atmospheric electricity, including that of auroras and earth currents, has a small section in this REVIEW, Professor Bigelow contributes the following section on terrestrial magnetism.

THE COMPARISON OF TEMPERATURE WITH MAGNETIC HORIZONTAL FORCE.

By Prof. F. H. BIGELOW.

In response to the request of the Chief of the Weather Bureau, the directors of the observatories at Toronto, Washington, and San Antonio have courteously undertaken to forward to the Bureau, as promptly as possible, certain data from their magnetograms, namely, the mean ordinates for the day from twenty-four hourly readings of the horizontal force, the declination, and the vertical force, uncorrected for instrumental errors and changes of temperature. On days exhibiting very disturbed magnetic conditions the hours and the values of the maximum and minimum ordinates are given.

The object in collecting these data is to institute a comparison between the crude magnetic readings, particularly of the bifilar, and the temperature changes at meteorological stations in the Northwest. Ultimately such comparisons will show how far unreduced magnetic observations may be available for determining the direction and the intensity of the temperature variations and other weather conditions before these become fully developed, as given by the isotherms and isobars of the daily weather maps. It has already been shown that weather and magnetism conform on the average to a normal type, but the problem of the synchronous changes from day to day is still under advisement as a practical feature in forecasting. The original data are presented on Chart V in a slightly reduced form, without further comment, thus offering the reader an opportunity for individual study.

The columns headed Calgary, Williston, and Sioux City give for each day, respectively, the mean of the 8 a. m. and 8 p. m. observations of temperature at the following groups of stations:

Calgary for Minnedosa, Qu'Appelle, Prince Albert, Swift Current, Medicine Hat, Battleford, Edmonton, Calgary.

Williston for Valentine, Yankton, Huron, Pierre, Moorhead, Bismarck, Williston.

Sioux City for Springfield, Mo., Kansas City, Wichita, Concordia, Omaha, Sioux City.

The average temperature for each group is reduced back to the origin, W. 115°, N. 55°, by a correction for eastward drift (see Amer. Jour. Sci., Dec., 1894). The first differences of these numbers are taken; then the monthly mean of the first differences for slope; then the variations on the slope; then these latter are added successively throughout the month and the accumulated sums give the ordinates of the curve for each group; the mean of these three groups is taken and gives the curve in the upper part of Chart V; the monthly mean of the ordinates is added with reverse sign to reduce to a true datum line. Thus, the eastward drift and the slope have been eliminated, and the variations reduced to a zero base line.

The magnetic data are treated in the same way as the temperatures. The curve as plotted is the mean of the ordinates of the three stations. It has been found that at least five magnetic observations are required to eliminate local conditions and to give a true value of the external impressed field, though seven are better. By inspecting the columns it will be seen that local variations disturb the curves in certain cases. Hence, as the data now exists, the comparison can give only partially accurate curves as to detail, though the main features may be expected to appear.

SPECIAL FEATURES OF THE DECEMBER CURVES.

The temperature and magnetic force variations need no correction for slope; San Antonio is reduced for amplitude by the factor $\frac{1}{3}$; the mean temperatures are reduced to a zero datum line by +1, and the mean magnetic force by —2.

The 26.68 day period began on December 20.26.

Light magnetic disturbances were reported from San Antonio on December 13, 14, 15, and 16.

INLAND NAVIGATION.

STAGE OF WATER IN RIVERS.

The following table shows the danger point and the highest and lowest stages for the month of December, 1894:

Heights of rivers above low-water mark, December, 1894.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
Red River.	*Feet.*	*Feet.*		*Feet.*		*Feet.*
Shreveport, La.	29.2	— 4.2	27	— 5.5	2-4	1.3
Arkansas River.						
Fort Smith, Ark	22.0	1.4	5, 6, 10, 11	0.1	1	1.3
Little Rock, Ark	23.0	4.7	12	2.3	1	2.4
Missouri River.						
Pierre, S. Dak. *	13.0					
Sioux City, Iowa *	18.7					
Kansas City, Mo. †	21.0	6.9	27	4.3	21	2.6
Mississippi River.						
St. Paul, Minn	14.0					
La Crosse, Wis. ‡	10.0	2.1	7-9, 12, 13	1.0	1	2.0
Dubuque, Iowa †	16.0	2.2	13-16	0.3	4-28	1.9
Davenport, Iowa †	15.0	1.8	28	— 0.2	6	2.0
Keokuk, Iowa †	14.0	1.2	20	— 0.5	4	1.7
Hannibal, Mo	17.0	1.4	21, 22	— 0.8	31	2.2
St. Louis, Mo	30.0	3.7	5	1.5	30	2.2
Cairo, Ill	40.0	12.6	21	4.6	1	8.0
Memphis, Tenn	33.0	5.9	25	— 0.1	1, 2, 4	6.0
Vicksburg, Miss	41.0	5.1	30	— 4.0	1	9.1
New Orleans, La	13.0	3.7	28	2.5	10	1.2
Ohio River.						
Parkersburg, W. Va	38.0	13.0	15, 16	5.0	1	7.0
Cincinnati, Ohio	45.0	19.4	18	6.8	4, 5	12.6
Louisville, Ky	24.0	10.0	20	3.8	6, 7	6.2
Cumberland River.						
Nashville, Tenn	40.0	13.6	17	1.2	4, 6, 7	12.4
Tennessee River.						
Chattanooga, Tenn	33.0	11.2	14, 15	0.9	2-8	10.3
Knoxville, Tenn	29.0	7.9	14	0.0	1, 2	7.9
Monongahela River.						
Pittsburg, Pa	22.0	9.2	14	2.8	30	6.4
Savannah River.						
Augusta, Ga	32.6	25.0	14	5.3	3	19.7

Heights of rivers—Continued.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
Willamette River.	*Feet.*	*Feet.*		*Feet.*		*Feet.*
Portland, Oregon	15.0	6.8	12	2.6	28, 29	4.2
Alabama River.						
Montgomery, Ala	48.0	15.4	15	— 0.1	7-9	15.5
James River.						
Lynchburg, Va	18.0	2.6	14	0.0	4, 9, 29	2.6
Sacramento River.						
Red Bluff, Cal	22.0	21.5	21	1.0	2	20.5
Sacramento, Cal	25.0	20.0	31	9.2	1, 5	10.8

* River frozen. † Record for 28 days. ‡ Record for 27 days.

ICE IN RIVERS AND HARBORS.

Albany, N. Y., 24th, navigation on the Hudson River closed to-day.

Buffalo, N. Y., navigation closed 25th.

Cairo, Ill., ice floating in river 28th; on the 29th navigation temporarily closed on Mississippi River, and running ice in that river and the Ohio River; 30th, navigation impeded on Ohio River.

Chicago, Ill., 10th, navigation closed.

Cleveland, Ohio, floating ice 28th to 31st, and navigation closed 31st.

Des Moines, Iowa, 23d, river frozen.

Detroit, Mich., navigation closed 20th.

Duluth, Minn., navigation closed 7th.

Grand Haven, Mich., 31st, ice in river.

Green Bay, Wis., 10th, navigation closed.

Harrisburg, Pa., 28th, river frozen.

Keokuk, Iowa, Mississippi river frozen 29th.

La Crosse, Wis., 25th, floating ice in river; 27th, river gorged on east side, but west channel clear.

Marquette, Mich., 4th, navigation closed.

New Brunswick, N. J., navigation on Raritan River closed by ice 29th.

Louisville, Ky., 31st, floating ice in river.

Parkersburg, W. Va., 28th, running ice in Ohio and Kanawha rivers; 29th, ice in Kanawha River; 30th, considerable running ice in Ohio River.
Pittsburg, Pa., navigation closed on the Monongahela River 29th, and on the Ohio River 30th.
Port Huron, Mich., 14th, last up-boat of the season passed up the lake to-day; the last boat going down the lake 19th; 28th to 31st, floating ice on lake and in St. Clair River.
Rochester, N. Y., Erie Canal closed to navigation 1st.
Sandusky, Ohio, navigation closed 16th.
Sault Ste. Marie, Mich., navigation closed 6th.
Sioux City, Iowa, navigation closed 28th.
Toledo, Ohio, navigation closed 27th.
Bluffton, Mo., 28th, floating ice in Missouri River.
Miami, Mo., 28th, Missouri River blocked by ice.
Lynch, Nebr., 25th, navigation on Missouri River closed.
Niobrara, Nebr., 29th, teams crossing the ice on Missouri River.
Pierre, S. Dak., Missouri River frozen during the month.
Muscatine, Iowa, 28th, heavy floating ice in Mississippi River.
Marietta, Ohio, floating ice in Ohio River 29th to 31st.
Paducah, Ky., 29th to 31st, running ice in Ohio River.
North McGregor, Iowa, 15th, ice moved out of Mississippi River; 26th, river closed at 4.30 a. m.
St. Joseph, Mo., ice in Missouri River, 2d; river clear of ice at 3 p. m., 6th; 27th, running ice.
Portsmouth, Ohio, floating ice in Ohio River 29th to 31st.
Wheeling, W. Va., 27th to 31st, floating ice in Ohio River.
Kansas City, Mo., 28th, floating ice in Missouri River; 29th, river frozen.
Dubuque, Iowa, 29th, Mississippi River frozen.
Davenport, Iowa, 1st to 6th, ice in Mississippi River; 29th, river frozen.
Cincinnati, Ohio, 29th, Ohio River partly frozen.
Chester, Ill., 28th, ice in Mississippi River.
Le Claire, Iowa, Mississippi River frozen 1st to 6th; river clear 7th; river frozen 27th.
Hermann, Mo., 12th, navigation closed on Missouri River; 28th, heavy floating ice; 30th, river gorged at 11 a. m.
Freeport, Pa., 29th, floating ice in Allegheny River; 30th, river closed.
Greensboro, Pa., 29th, navigation closed on Monongahela River.
Lock No. 4, Pa., Monongahela River frozen 28th; 29th to 31st, running ice.

SUNSHINE AND CLOUDINESS.

GENERAL REMARKS.

The quantity of sunshine, and therefore of heat, received by the atmosphere is a fundamental factor in meteorology; the quantity received by the atmosphere as a whole is very nearly constant from year to year, but the proportion received by the surface of the earth depends largely upon the absorption by the atmosphere and varies with the distribution of cloudiness. The sunshine is now recorded automatically at about 38 regular stations of the Weather Bureau, either by its photographic or its thermal effects. The cloudiness is recorded by personal observations at all stations and is given in the column of "average cloudiness" in Table I.

SUNSHINE.

An instrumental record of sunshine has been kept during the month at 16 stations by means of the photographic sunshine recorder and at 24 stations by means of the thermometric sunshine recorder; the results of these observations are given in Table IV, for each hour of local mean time (not seventy-fifth meridian time). The stations recording the largest percentages of sunshine between the hours of 11 a. m. and 1 p. m. were: Key West, 92; Denver, 85.5; Norfolk, 82.5; New Orleans, 78; Vicksburg, 77.5. The stations having the least percentage between those hours were: Cleveland, 27; Portland, Oreg., 31; Rochester, 33.5; Spokane, 35; Tucson, 39.5.

The general average percentage for the whole month is given in the next to the last column of Table IV. The highest percentages were: Key West, 79; Denver, 73; Norfolk and Dodge City, 71; Savannah, 70; Baltimore, 66; New Orleans, 65; Galveston and New Haven, 63. The lowest percentages were: Cleveland, 25; Rochester, 28; Portland, Oreg., 30; Spokane, 33; Seattle and Columbus, Ohio, 37; Tucson, 39.

CLEAR SKY.

The average cloudiness between sunrise and sunset, as based on numerous personal observations, is given for each Weather Bureau station in Table I; the complement of this average cloudiness gives the observer's estimated percentage of clear sky and these latter numbers are given in the last column of Table IV.

COMPARISON OF SUNSHINE AND CLEAR SKY.

The sunshine registers give the duration of direct sunshine whence the percentage of possible sunshine is derived; the observer's personal estimates give the percentage of area of clear sky. It should not be assumed that these numbers should agree, and for comparative purposes they have been brought together, side by side, in the following table, from which it appears that, in general, the instrumental record of percentages of duration of sunshine is almost always larger than the observer's personal estimates of percentages of area of clear sky; the average excess for this month is 3 per cent for photographic records and 6 per cent for thermometric records. Attention has lately been called to a similar excess in the records of the observers in India.

Difference between instrumental and personal observations of sunshine.

Photographic stations.	Instrumental.	Personal.	Difference.	Thermometric stations.	Instrumental.	Personal.	Difference.
Denver, Colo	73	65	8	Key West, Fla	79	67	12
Dodge City, Kans	71	63	8	Norfolk, Va	71	60	11
Savannah, Ga	70	63	7	Baltimore, Md	66	55	11
Galveston, Tex	63	62	1	New Orleans, La	65	65	0
Santa Fe, N. Mex	60	51	9	New Haven, Conn	63	56	7
Kansas City, Mo	59	57	2	Wilmington, N.C	59	58	1
Bismarck, N. Dak	58	55	3	St. Louis, Mo	56	51	5
Memphis, Tenn	55	59	— 4	Vicksburg, Miss	56	53	3
Helena, Mont	54	49	5	Philadelphia, Pa	56	49	7
Eastport, Me	50	35	15	Washington, D. C.*	55	53	2
Cincinnati, Ohio	45	40	5	Des Moines, Iowa	55	51	4
San Diego, Cal	42	42	0	Boston, Mass	52	45	7
Tucson, Ariz	39	32	7	Salt Lake City, Utah	52	38	14
Spokane, Wash	33	26	7	Little Rock, Ark	51	40	11
Portland, Oreg	30	43	—13	San Francisco, Cal	48	26	22
Cleveland, Ohio	25	31	— 6	Chicago, Ill	45	44	1
				Louisville, Ky	45	35	10
				New York, N. Y	45	43	2
				Portland, Oreg	43	43	0
				Buffalo, N. Y	39	29	10
				Detroit, Mich	38	34	4
				Columbus, Ohio	37	37	0
				Seattle, Wash.†	37	38	— 1
				Rochester, N. Y	28	28	0

No record for Portland, Me. *Formerly a photographic now a thermometric register. †Record for 29 days.

OBSERVATIONS ON THE GREAT LAKES.

REPORTS FROM U. S. LIFE-SAVING STATIONS.

Through the co-operation of the General Superintendent of the Life-Saving Service and the Secretary of the Treasury, the Weather Bureau has received monthly reports for the month of December, from the keepers of 24 U. S. Life-Saving Stations on the Great Lakes.

REPORTS FROM VESSELS.

The Lake Marine Section, Forecast Division, has received reports from the captains of 60 vessels navigating the Great Lakes.

STATE WEATHER SERVICES.

A tabular summary of the more prominent climatological features of each State and Territory, as given in the reports for December by the directors of the respective State Weather Services, is presented in Table XII. This table gives for the whole area of any State: (*a*) the average departure from the normal values of the current monthly mean temperatures and total precipitations; (*b*) the maximum and minimum temperatures and precipitations; (*c*) the greatest and least monthly ranges of temperature occurring anywhere within the State. This table is essentially a summary of Table II, and therefore presents a somewhat different study of meteorological conditions from that given in Table I, which is based on regular Weather Bureau stations arranged in so-called climatic districts.

The following extracts are taken from the reviews published by the respective services; occasional notes in brackets are added by the Editor:

Alabama.—The weather in December was almost a repetition of the usual conditions, except in the last week, when a decided cold wave overspread the entire State, beginning on the afternoon of the 26th and continuing until the end of the month. Unusually low temperatures occurred on the mornings of the 28th and 29th, going as low as zero in the northern and central portions, and freezing conditions prevailed generally throughout the entire State, but without much ice in the navigable rivers.

Arizona.—The characteristic features of the month's weather were abnormally high average temperatures, an unusual proportion of cloudy days, and excessive precipitation.

California.—Special reports received from all portions of the State say that the excess of rain over the normal has put one of the brightest phases on the rural industries of this State that has been known for many years past, especially in the great San Joaquin Valley and in southern California. Thousands of acres will be plowed and sown to hay and grain which would never have been thought possible under less favorable circumstances. A great many new orchards will be set out. Feed was never better so early in the season than at present, and stock that was starving a few months ago in certain districts is now sleeking up and looking in first-class condition.

Colorado.—The average temperature for the month was about 2° below the December normal.

Florida.—During the first twenty-six days of the month the temperature, which was in excess at the beginning of December, continued to accumulate almost uninterruptedly until on the 27th a cold wave began to be felt; this increased in severity until the 29th, on which date the lowest temperatures since the beginning of observations by the Weather Bureau were recorded, the average minimum for the State being on that date about 5° lower than any previously registered. The temperature fell to 18° as far south as Titusville. This severe freeze practically destroyed nearly all that part of the orange crop remaining ungathered, estimated at about two or three millions of boxes, and did, it is feared, great damage to orange groves and fruit trees of all kinds. The temperature fell to 14° at Jacksonville, and 24° at Jupiter, and killing frosts occurred at all stations, except at Key West.

Georgia.—The month of December was unusually pleasant and mild, with no severe cold waves or storms until the 25th, when there was quite a marked change in the weather conditions; rainy and unsettled weather set in, followed on the 27th, 28th, and 29th by a severe cold wave which swept over the entire State, bringing the mercury down to zero in the most northerly districts and far below the freezing point in the extreme southern counties.

Idaho.—Clear and cold weather prevailed over the entire State at the opening of the month and until the 5th, from which date until the 11th moderately heavy snowfall was generally reported The snowfall for the remainder of the month was light and widely scattered until the 15th, after which snowfall was reported over the greater portion of the State until the end of the month. The coldest period was from the 26th to the 29th.

Illinois.—The first number of "Weather and Crops," published by the Illinois State Weather Service says: "December was a most favorable and pleasant month until after Christmas, when rain and snow were followed by cold weather on the 27th. In many portions of the State fall plowing was not interrupted until this cold period. In all sections grain sown in the fall was reported in good condition on the first of the new year. The average temperature of the State was about 5° above the normal; the average rainfall was about one-quarter of an inch below the normal.

Indiana.—Warm, dry, and very pleasant weather during the greater portion of the month of December; on most days the daily mean temperature was excessive, and the average excess for the State was 2.4°. Precipitation was also slightly in excess. Good rains falling at the beginning of the month, and very much snow, ended the drought in the southern, but not so in the other portions. Pasturage had suffered much, but wheat is in better condition, having recovered somewhat, and it was protected by snow during the freezing days at the end of the month.

Iowa.—The month was unusually warm, dry, and pleasant. The only exceptionally severe weather was during the prevalence of the cold wave on the 26th to 28th. The average precipitation for the State was 0.70 of an inch below the normal for December. The amount of snowfall was unusually light.

Kentucky.—The average maximum temperature was a little in excess of the normal, but the average minimum was slightly below it. The warmest periods of the month were about the 1st, 7th to 12th, and 14th to 17th, while the coldest were from the 3d to the 5th, and 26th to 31st. On the 28th and 29th occurred one of the severest cold waves ever known in this State for that time of the year. Many stations report temperatures on the morning of the 29th ranging from 2° to 11° below zero. Fortunately this extremely low temperature was preceded by a heavy snowfall which remained upon the ground, and thus served as a protection for winter wheat, which would otherwise have suffered severely.

Louisiana.—Compared with normal conditions, deduced from the observations of the past seven Decembers, the weather in north Louisiana averaged nearly 2° colder during this month than usual, with a rainfall that was deficient by about 0.3 of an inch. In the southern half of the State a normal mean temperature prevailed, the days being about half a degree warmer than usual and the nights averaging about half a degree colder. The warmest weather occurred very generally on the 8th and 9th; the coldest days were the 26th, 27th to 29th, during which period minimum temperatures ranging between 5° and 15° were reported from the interior and northern parishes, and minima ranging between 20° and 30° occurred at stations along or near the Gulf coast. This cold wave was one of the most severe ever experienced in Louisiana, nearly equaling in intensity the general "freeze" of January, 1886. Ice formed as far south as the Gulf coast parishes, and there was a general destruction of vegetation, though it is reported that cane and orange trees showed no damage in the lower portion of Plaquemine parish. Considerable damage was done to orange trees, standing cane, and vegetation in the northern portion of the parishes bordering on the coast, while still farther inland there was a general "freezing up."

Maryland.—Monthly mean temperature for the month was 0.2° above the normal; precipitation, 0.34 above the normal; greatest fall of snow in Maryland, 22 inches, is reported by the observer at Oakland.

Michigan.—The mean temperature of the State for the month was 2.9° above the normal. Precipitation showed a deficiency of 1.18 inch.

Minnesota.—The monthly mean temperature for the State, as determined from 61 stations, was 6.8° warmer than usual. The minimum was 30° below zero at Leech Lake Dam on the 27th, and the lowest temperatures for the month at all stations occurred during the cold spell on the 26th, 27th, and 28th.

Mississippi.—The mean temperature for the month was 1.8° above the normal. The total precipitation averaged 0.94 inch below the normal. Snowfall, ranging from 4 inches in the extreme northern portion of the State to only a trace in the middle portion, occurred on the 28th, 29th, and 30th of the month. The following special report was received from Leakesville, Miss.:

"A cyclone passed over the northeast portion of the county on the 11th. It struck the premises of Mr. G. Cochran, blew down his dwelling, carried off all the household furniture, etc.; also demolished five outhouses, killed five head of horses and mules, destroyed 200 bushels of corn and a good many meat hogs and cattle. The storm destroyed many thousand dollars' worth of timber."

Missouri.—From the beginning of the month until the 24th the temperature was above the normal generally, except on the 2d, 3d, and 4th, the average daily excess amounting to about 6° in the southern and 8° in the northern sections. The weather was pleasant for outdoor work, and in some sections plowing was continued until the 26th. On the 26th and 27th there was a heavy fall of snow over the extreme southeastern counties, and during the 27th and 28th an area of unusually high pressure passed over the State, accompanied by a severe cold wave, the temperature falling to zero or below at nearly all stations on the morning of the 28th. Stock water is still very scarce in many of the central and northern counties. Average precipitation for the State only 0.03 of an inch below the normal.

New England.—Eight cyclones and seven anticyclones influenced the weather for the month. Of the former five passed eastward to the north of New England, one faded away as it approached our district, one was formed over southern New England, moving northeasterly, and one passed across our district from north to south. The last named was the severest of the month and was accompanied by damaging gales and heavy snow and rain. It moved from the Gulf of Mexico on the 24th, passed up the coast and northerly over New England on the 26–27th. The last anticyclone for the month spread from the northwest toward the southeast and covered all the southern and eastern parts of the country. It gave very high barometer readings and a sharp cold wave. It was not unusually severe in New England. In many parts of Connecticut the month was very mild, the observer at Norwalk reporting that the ground was entirely free from frost up to the 17th and that much plowing was done. He states that he put in a full day with the plow himself on the 17th, with not a particle of frozen earth to be found. The last part of the month was very cold in all sections.

New Mexico.—The average temperature for the month was slightly above the normal. The warmest period of the month was about the 20th and the coldest from the 26–28th. There was more cloudy weather than usual for December. The precipitation averaged a little above the normal, but was

very unevenly distributed, being heaviest in the north-central part. The greatest total snowfall for the month was 17 inches at Winsor's Ranch, on the headwaters of the Pecos River, and 25 inches at Chama. All other stations report little or no snowfall.

North Carolina—December was nearly normal in its chief features. During the greater part, from the 1st to 27th, the temperature was decidedly above the normal, the warmest days occurring on the 2d, 12th, 17th, and 22d, but the severe cold wave of the latter part of the month reduced the mean very considerably. The low temperatures recorded on the morning of the 29th were probably never before equaled in this State in December, though lower temperatures have occurred in January.

North Dakota.—The only unusual feature that characterized this month was its mildness. The temperature was unusually high, the winds light, and but little precipitation fell, and although there was a cold wave on the 26th, 27th, and 28th, it was not severely felt and soon passed away. On the 20th a very unusual occurrence was a thunderstorm in the southern portion of the State, something the people who have lived in that section a long time report not to have happened before. In the northern part of the State on the same day there was a rainstorm, something as unusual as the thunderstorm. The temperature at Bismarck averaged 8.4° higher for each day of the month than the normal or mean obtained from eighteen years' observations.

Ohio.—The month averaged slightly warmer than usual over the State. Up to the 25th temperatures ranged considerably above the normal; on that day the entrance of a severe cold wave, rapidly developing from the northwest, constantly lowered the temperature until the 29th, when it culminated below zero temperature over all sections of the State. The precipitation during the month was well distributed and was in excess of the average. The heaviest snowfall occurred on the 28th in advance of the cold wave from the northwest, covering the ground completely and affording ample protection from the severe cold that followed to the winter cereals in the ground. The percentage of weather forecasts received from Washington and distributed to 119 points over the State was 93 for temperature and 92 for weather. The cold-wave warnings of the latter part of the month were widely distributed and amply justified, and have no doubt proved of great value to all communities over the State where received.

Oklahoma.—The month was remarkably mild and pleasant until the afternoon of the 25th when a cold wave of considerable force began and continued until the close of the month. The maximum degree of cold was reached at 7 a. m. of the 28th, when the temperature was 1° below zero. The first snow of the season occurred on the 26th. The month closed leaving the ground practically without moisture, and wheat in bad shape. Farmers generally state that most of the roots are dried up and the germs without life.

South Carolina.—The month was remarkable chiefly for its extreme range of temperature, between 1° below zero and 85° above within the State. From available records it appears that the total snowfall during the month was the greatest ever recorded, especially in the north-central portion of the State, where in places it fell to a depth of 10 inches.

South Dakota.—The weather was unusually mild during the first two decades of the month. Comparatively little snow fell, and this, together with the generally mild and pleasant weather, was very favorable to live stock, which fed uninterruptedly on the ranges.

Tennessee.—While the mean temperature of the month was but little below the normal, several extremes occurred at intervals, the most noted of which was the cold wave of the 28–29th, causing abnormally low temperatures at most places on those dates. Owing to the fact that the ground was well covered with snow wheat suffered little or no damage. The warmest day during the month was the 8th and the coldest the 28th.

Virginia.—The temperature averaged very slightly below the normal in the northern portions of the State and slightly above in the interior, southern, and eastern. The coldest periods were the 5–7th, 18th–21st, and last six days of the month, with a very decided and sudden cold wave on the 28th and 29th, which gave the coldest temperature for the calendar year throughout the State, with temperatures of between zero and 11° below zero in the western portions of the State. The snow about the 26th proved of great value to winter crops, by affording protection during the severe cold wave of 28–29th, and from 1 to 4 inches of snow were still on the ground at the end of the month in the southwest and the valley.

Washington.—The month was noteworthy for its low mean temperature, which was about 4° below the normal, and for its deficiency in precipitation of about 1½ inch. The last nine days of the month were remarkably pleasant. A remarkably severe low-area storm prevailed over the coast from the 6th to the 11th, when the barometer touched the lowest point in recent years. There was considerable snow, particularly in the eastern part of the State. The coldest day was generally the 28th.

Wisconsin.—The month was remarkably mild. Up to the 24th there was very little frost in the ground and the farmers were plowing up to that date. A cold wave passed over the State about the 5th and another on the 14–16th, upon which dates the temperature fell below zero, while the warmest day occurred on the 20th. From the 24th to the end of the month the weather was cold and little or no snow lay on the ground.

NOTES BY THE EDITOR.

TEMPERATURE OF THE WATER, SEBAGO LAKE, NEAR PORTLAND, MAINE.

A record of the temperature of the water as it flows from Sebago Lake into the aqueduct that supplies the city of Portland, Me., has been kept by the gatekeeper, Mr. J. W. Hinkley. The following monthly averages corrected for the small thermometer errors have been kindly communicated by Mr. John M. Gould of that city:

1894.	°	1894.	°
January	34.5	August	74.8
February	34.5	September	65.5
March	35.1	October	56.2
April	37.3	November	46.7
May	46.0	December	37.9
June	59.3		
July	71.0	Annual	49.9

The ice went out of the lake April 18. The lake was frozen over December 30; it was therefore open 226 days.

BALLOON ASCENSION, DECEMBER 4, 1894.

On December 4, 1894, Dr. A. Berson, starting from Berlin, made a high ascension whose results, as given by Mr. O. Chanute in "Aeronautics," are of interest in connection with the area of high pressure then advancing westward over Europe.

The balloon started at 10.28 a. m., with a charge of 70,600 cubic feet of water gas. A strong east wind had been blowing during the preceding afternoon and night, but had diminished somewhat in the morning. The drag line, 650 feet long and weighing 180 pounds, was stretched on the ground in the direction of the wind in order that its weight might be taken up gradually as the balloon rose, thus insuring a very rapid rise at the start and consequent escape from interfering obstacles. The general trend of the voyage was toward the northwest. The ascent occupied three hours and the descent two hours and twenty minutes. The landing occurred at 3.45 p. m., a short distance west of Kiel. The following abstract of the observations is reported:

Time.	Altitude.	Temperature.	Remarks.
	Feet.	*° F.*	
10.40 a. m.	4,900	41	Up to this point the temperature had risen steadily.
10.43 a. m.	6,500	.....	Fog and clouds below the balloon.
11.30 a. m.	16,400	0	Air very dry.
11.49 a. m.	19,700	—14	
12.00 m.	22,150	—20	
12.25 p. m.	26,250	—38	
.....	26,900	.....	
.....	27,900	—43	
.....	29,500	.....	Balloon cuts through a thin veil or stratum of cirrus clouds consisting of perfectly formed flakes of snow and not simple ice crystals.
12.45 p. m.	30,000	.....	The altitude as indicated on the aneroid barometer, which stood at 9.12 inches, was 31,500, but when properly corrected the actual height was 30,000. The mercurial barometer had already frozen at about noon, when the actual temperature was —20. This was the highest point reached; the balloon was covered with a thin envelope of snow; the sky was free of clouds and of a pure cold blue. The aeronaut was in good condition, having been sustained by inhalation from a special supply of oxygen. A farther ascent was not considered advisable in view of the small amount of ballast remaining.
1.26 p. m.	29,850	—52	Small gas valve opened and descent began.
3.40 p. m.	4,600	43	This was the highest temperature during the descent.
.....	1,650	.....	Swimming on the upper surface of the cloud-waves.
.....	820	.....	At the lower surface of the clouds the earth appears.
3.45 p. m.	.....	34	On ground.

Among the results of the voyage the following may be stated:

1. The attainment of great altitude.

2. Observations of uncommonly low temperatures and many wide variations of temperature.

3. The increase of temperature up to 41° at 4,900 feet at 10.40 a. m., and up to 43° at 4,600 feet at 3.40 p. m., showing

that this so-called inversion, formerly supposed to characterize the lower atmosphere during the nighttime, actually occurs also during the daytime and up to very great heights.

Similar observations and results were obtained in the four balloon voyages made for the Weather Bureau by Mr. Hammon, under the general supervision of the present Editor, an account of which was published in the American Meteorological Journal, Vol. VII. These were the first that were made accurately enough to show that in the daytime, and especially in the winter and early spring, the temperature of the atmosphere increases as we go upward to an elevation somewhere between 2,000 and 5,000 feet. As the same inversion occurs probably always in connection with every area of high pressure, it must be looked upon as a general phenomenon whose explanation is to be found not in local conditions, but in some very general law of physics. In an article on the atmospheric radiation of heat (Am. Met. Journ., VIII, p. 537) the author has shown that the existence of a stratum of air at some moderate height, probably always below 2,000 meters, whose temperature is warmer than that of the layers either above or below it, is a normal phenomenon in clear weather, and is due to the combination of warming by compression and cooling by radiation as the air slowly descends toward the earth's surface. The curves connecting the temperature at any height with the temperature at the earth's surface are of an approximate hyperbolic form, as shown on page 550 of the journal referred to, and have the adiabatic temperature line as an asymptote. The diminution of temperature in ascending air is also a similar combination of the effects of cooling by radiation and by expansion; but if the ascent is rapid the effect of radiation is correspondingly unimportant and may generally be neglected or considered as compounded with the cooling by mixture that takes place in the case of rapid ascent. The ascent or descent of air will occur for either of the following causes, namely, excess of density due to coolness or to dryness or an excess of pressure due to motion. When the rate of diminution of temperature with altitude is about 1° F. for 187 feet, or 1.6° for 300 feet, dry air will have a density in each layer such that it will have no tendency to rise or sink and is said to be in neutral or indifferent convective equilibrium. A more rapid rate of cooling would constitute a state of unstable convective equilibrium such that when an upper layer settles down and displaces a lower mass it will be colder than the latter even after being warmed up by the compression that it experiences, so that ascending and descending air tend to perpetuate their movements. A less rapid rate of diminution of temperature would constitute a state of stable equilibrium with no tendency to topsy-turvy interchanges.

In the case of the balloon voyage of December 4 the layer of air below 4,600 feet had, at 3.45 p. m., a vertical temperature gradient of plus 1° F. in 500 feet; that is to say, not merely a less rapid diminution of temperature, but a positive increase of temperature upward. It was, therefore, in a very stable condition. The layer between 4,600 and 30,000 feet had a gradient of 1° F. diminution in 270 feet, which is also a very stable condition. In general, on that day the stability of the air increased with approach to the earth's surface, showing that the air which was descending slowly in an area of high pressure was cooled as it approached the earth's surface more rapidly than it was warmed by compression. Undoubtedly this is a general characteristic of the atmosphere in areas of high pressure.

THE STORM AT PONTA DELGADA, DECEMBER 8, 1894.

By the recent establishment of self-registering instruments at the meteorological observatory in charge of Fr. Francis Chaves at Ponta Delgada, in the Island of San Miguel (Azores), we are now, for the first time, able to follow the details of wind and pressure of Atlantic storms that pass near those islands.

Fr. Chaves states that—

> By an examination of the barograph curves, by the direction of the wind (which changed from south-southeast through the south to south-southwest, then to southwest, and finally to west-southwest during the great barometric depression), and by the violence of the wind (26 meters per second or 93.6 kilometers per hour at 11 hours 55 minutes p. m., and for three hours with a mean hourly velocity of 80 kilometers, and one hour with a velocity of 85), I think one might conclude that a part of the dangerous zone of the cyclone passed over this place, but from further information that I have already obtained, especially that furnished by the captain of a steamer coming from Lisbon to this place, I find that the center of the storm moved in a straight line and with such great velocity (66 kilometers per hour) that it should be looked upon as a hurricane without the classic cyclonic rotation of the winds. I am more than ever convinced that the Azores offer a fine field for the study of meteorology.

The following table presents the record of hourly readings during the 7th and 8th of the current month:

Observations at Ponta Delgada, December 7 and 8, 1894.

Date.	Dry bulb.	Wet bulb.	Barometer.	Wind.		
				Direction.	Velocity, per second.	Hourly movement.
	°C.	°C.	Mm.		Meters.	Km.
7th, midnight	16.4	5.7	766.4	.....	.....	.....
1 a. m.	16.0	5.8	766.0	.....	.....	.....
2 a. m.	15.2	5.8	765.3	.....	.....	.....
3 a. m.	15.3	5.8	765.0	.....	.....	.....
4 a. m.	16.0	5.7	764.0	.....	.....	.....
5 a. m.	16.0	5.8	764.1	.....	.....	.....
6 a. m.	16.1	6.2	763.8	.....	.....	.....
7 a. m.	16.3	6.4	763.2	.....	.....	.....
8 a. m.	16.5	6.5	763.0	.....	.....	.....
9 a. m.	16.7	6.5	762.9	S. 20° E.	.....	.....
10 a. m.	17.0	6.6	762.2	S. 20° E.	11.0	*
11 a. m.	17.2	6.6	761.0	S. 20° E.	11.0	40
noon	17.5	6.5	761.0	S. 20° E.	11.6	41
1 p. m.	17.3	6.1	760.1	S. 20° E.	10.9	42
2 p. m.	16.5	6.1	759.1	S. 15° E.	12.5	43
3 p. m.	16.6	6.4	758.5	S. 15° E.	10.5	43
4 p. m.	16.6	6.3	756.9	S. 22° E.	12.0	37
5 p. m.	16.8	5.6	755.0	S. 25° E.	14.0	45
6 p. m.	17.2	5.7	754.0	S. 25° E.	14.8	53
7 p. m.	17.2	6.1	753.3	S. 22° E.	15.5	57
8 p. m.	16.9	6.0	752.0	S. 22° E.	15.8	58
9 p. m.	16.5	6.1	750.5	S. 22° E.	17.4	68
10 p. m.	16.5	6.2	749.0	S. 22° E.	21.0	70
11 p. m.	17.0	6.4	747.0	S. 20° E.	22.4	80
8th, midnight	17.5	6.7	745.4	S. 17° E.	†24.0	80
1 a. m.	17.1	6.6	743.3	S. 11° E.	24.0	80
2 a. m.	16.7	6.7	740.5	S.	25.0	85
3 a. m.	16.9	6.7	‡736.3	S. 65° W.	16.0	70
4 a. m.	16.5	6.5	737.9	S. 67° W.	14.5	55
5 a. m.	16.8	6.0	740.5	S. 69° W.	18.0	55
6 a. m.	16.2	5.7	743.5	N. 80° W.	15.0	45
7 a. m.	16.3	5.5	747.0	N. 80° W.	16.0	50
8 a. m.	16.0	4.7	749.9	S. 80° W.	10.8	47
9 a. m.	16.0	4.6	751.6	S. 75° W.	9.5	33
10 a. m.	16.0	4.6	753.1	.....	8.0	30
11 a. m.	16.1	4.3	753.9	.....	.....	.....
noon	16.3	4.3	754.1	.....	.....	.....
1 p. m.	16.3	4.3	754.0	.....	.....	.....
2 p. m.	16.3	4.3	754.8	.....	.....	.....
3 p. m.	16.2	4.0	755.0	.....	.....	.....
4 p. m.	16.2	4.5	755.0	.....	.....	.....
5 p. m.	16.1	4.5	754.9	.....	.....	.....
6 p. m.	16.1	4.7	755.4	.....	.....	.....
7 p. m.	16.2	4.8	755.9	.....	.....	.....
8 p. m.	16.2	4.9	756.0	.....	.....	.....
9 p. m.	16.1	5.0	756.3	.....	.....	.....
10 p. m.	16.0	4.8	756.2	.....	.....	.....
11 p. m.	16.0	4.9	756.0	.....	.....	.....
midnight	16.1	4.9	755.2	.....	.....	.....

* Each movement is for the hour ending with the moment for which it is given.
† Maximum velocity 26.0, at 11.53.
‡ The lowest pressure was 736.2, at about 3 h. 10 m., and the oscillations in pressure, from 12.15 a. m. until 3.10 a. m., averaged 1.5 and seem to show that high southwesterly winds produce some slight and very local low pressure.

The remarks of Fr. Chaves as to the rapid movement of this hurricane center harmonize entirely with the description given in another section of these notes of the various modifications to which storms are subject. As explained in paragraph 12 of that section a trough of low pressure may oftentimes be simply an indication that a cyclonic whirl and barometric depression is moving rapidly in the direction of the axis of the trough, but so rapidly that the lower atmos-

phere at any given point has not time enough to show evidences of a well-marked whirl with circular isobars and central depression. The storm that passed the Azores on the 7th seems to have subsequently moved more slowly before it broke up on the European coast.

OBSERVATIONS AT HONOLULU, HAWAIIAN ISLANDS.

As the weather on our Pacific coast depends so largely upon the conditions of the atmosphere to the westward, it is considered important to publish in full and as soon as practicable the data furnished by observers in Alaska, the Hawaiian Islands, and adjacent regions.

Meteorological observations at Honolulu, Republic of Hawaii, by Curtis J. Lyons, Meteorologist to the Government Survey.

Pressure is corrected for temperature and reduced to sea level, but the gravity correction, —0.06, is still to be applied.

The absolute humidity is expressed in grains of water, per cubic foot, and is the average of four observations daily.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 10.

The rainfall for twenty-four hours is given as measured at 6 a. m. on the respective dates.

December, 1894.	Pressure at sea level.			Temperature.					Humidity.			Wind.		Cloudiness.	Rain measured at 6 a. m.
									Relative.						
	7 a. m.	2 p. m.	9 p. m.	6 a. m.	2 p. m.	9 p. m.	Maximum.	Minimum.	9 a. m.	9 p. m.	Absolute.	Direction.	Force.		
	Ins.	*Ins.*	*Ins.*	°	°	°	°	°	%	%					*Ins.*
1....	30.11	30.00	30.06	71	73	71	76	68	65	78	5.9	nne.	5-6	7	0.43
2....	30.11	29.98	30.04	69	73	70	74	68	67	79	5.8	ne.	5	10	0.44
3....	30.05	29.97	30.03	70	75	69	76	66	65	77	5.8	n.	3-5	5	0.17
4....	30.07	30.02	30.10	68	73	71	75	67	67	77	5.8	ne.	5	5	0.53
5....	30.17	30.10	30.17	70	74	71	75	65	67	65	5.5	ne.	4	5	0.05
6....	30.22	30.14	30.19	69	73	72	75	69	67	73	6.1	ne.	5	5	0.05
7....	30.20	30.13	30.18	71	72	71	74	69	64	67	5.9	nne.	5	7	0.10
8....	30.16	30.09	30.13	70	74	70	75	70	67	76	6.0	ne.	4	5	0.14
9....	30.16	30.07	30.13	70	75	72	77	68	61	74	6.0	ne.	4	4	0.04
10....	30.15	30.05	30.08	70	76	73	77	70	75	77	6.6	ene.	4	4	0.00
11....	30.09	29.98	30.05	67	78	69	79	67	74	90	6.9	se.	2	2	0.00
12....	29.97	29.88	29.95	67	77	69	79	65	79	95	7.0	se.	3	5-10	0.00
13....	29.99	29.95	30.04	68	75	75	76	67	90	73	6.9	e.	2-5	10	0.66
14....	30.12	30.03	30.10	73	75	72	76	72	74	....	6.9	ene.	5	5	0.30
15....	30.11	30.03	30.12	71	74	72	76	71	61	70	5.6	ene.	4	4	0.05
16....	30.15	30.06	30.13	70	74	72	75	68	59	69	5.6	ne.	5	7-3	0.10
17....	30.19	30.10	30.20	72	74	69	76	70	60	85	5.9	ne.	5	7	0.05
18....	30.21	30.11	30.21	71	74	71	75	66	61	61	5.3	ne.	5-6	5	0.15
19....	30.18	30.12	30.21	70	72	70	75	69	61	79	5.3	ne.	4	3	0.00
20....	30.20	30.12	30.19	68	74	70	75	66	65	71	5.7	ne.	4	4	0.06
21....	30.18	30.08	30.15	67	75	70	76	67	57	72	5.4	nne-ene	3	3	0.02
22....	30.15	30.07	30.17	65	75	70	77	65	61	73	5.6	ne.	3	2	0.03
23....	30.22	30.10	30.17	68	73	71	76	67	65	65	5.6	ne.	3	2	0.01
24....	30.21	30.07	30.15	69	74	70	75	69	53	64	5.1	ne.	3	2	0.00
25....	30.18	30.07	30.12	70	74	66	77	69	58	79	5.4	nne.	3	3	0.00
26....	30.11	30.03	30.08	66	74	66	77	63	53	77	5.2	nne.	2	1	0.00
27....	30.05	29.94	29.98	60	72	61	74	58	64	85	5.2	nw.	2	2	0.00
28....	30.02	29.96	30.02	62	71	70	74	59	84	73	5.5	ne.	2	4	0.06
29....	30.06	29.96	30.04	69	74	70	76	67	65	64	5.5	nne.	4	3	0.08
30....	30.04	29.96	30.06	67	75	65	76	65	61	80	5.5	ne.	2	3	0.00
31....	30.11	30.07	30.15	68	74	67	75	64	74	80	6.0	ne-se.	1	5	0.00
	30.19	30.04	30.11	68.6	74.1	69.8	75.8	66.9	65.9	72.5	5.82				3.52

Mean temperature: 6+2+9+3 is 70.8; the normal is .....; extreme temperatures 58, and 79.

LOCAL ELECTRICITY IN A WINDSTORM IN WYOMING.

Mr. John Hunton, voluntary observer at Fort Laramie, Wyo. (N. 42° 12′, W. 104° 31′, altitude 4,519 feet), reports as follows:

On December 20, at 1.30 a. m., observed vertical red streaks above and below moon. Each about one and one-quarter diameters of moon in width and each about one diameter of moon from it. One streak extended below the horizon, the other extended upward about 20 diameters of moon in length. At 10.15 a. m., same date, electrical wind storm of great velocity commenced and continued until 7 p. m. Maximum velocity of wind obtained at about 1.30 p. m., when three houses were unroofed and substantial steel tower windmill was blown down, causing a loss of about $700.

The wind was phenomenal in that it would remove and break to pieces the most solid wood work of buildings and leave adjoining frail parts of the wood work undisturbed. Reliable information, obtained from over a section of country extending 12 miles south and 20 miles east, states that the electrical current was freely felt in many localities embraced in that area.

Mr. Silas Doty, a very reliable man living 8 miles south, reports that he discovered a fence post on fire 200 yards north of his house, and upon going to it to extinguish the fire found it burnt more than half through where one of the fence wires was fastened, and partly burned where another wire was in contact with it. Other fence posts were slightly marked by the electric sparks.

Mr. John F. Barnes, another reliable man, living 11 miles south of here, states that in going from his stable to his house he caught hold of a fence wire to assist him in walking against the strong wind and received a severe electric shock from which he was some time recovering. He had a strong healthy cow in a lot inclosed with wire fence. The wind drifted the cow into a corner against the fence and held her there, where Mr. Barnes found her dead late in the evening. He thinks that long contact with the heavily charged wires killed her, as there was no mark of violence or internal derangement to cause death.

Mr. E. B. Hudson, 20 miles east of here, reports that two of his employees when going from work to house, soon after the commencement of the windstorm, were severely shocked when crossing a wire fence. One of the men caught hold of a wire and received a shock which numbed and weakened his hand to such an extent that he was unable to take it from the wire but had to release it with his other hand. The injured hand and arm remained nearly helpless for several moments. Mr. Hudson, as well as the other two men referred to, is a reliable, truthful man.

The above account reminds one at first of the electricity attending the sand storms or the hot simoon, and which is usually attributed to the friction of the particles of hot, dry sand. But electric phenomena generally attend the snow that is formed in strong winds of dry, cold air, as has been frequently observed in North America, Kamchatka, Siberia, and Russia, and we may, therefore, attribute the electricity to the formation of snow, even though it be of small amount and mostly in the clouds above us.

LOCAL CONTRASTS OF WIND AND WEATHER.

On December 1 Capt. A. H. Myers, keeper of the life-saving station at Quoddy Head, reported:

This is a queer day; on the coast at this station it is blowing strong south and raining; just across the basin it is fresh northwest and thick snow; at my house there is snow enough for sleighing; at the station not a flake. I have been watching this all day and never saw such a great difference in so short a space.

Quoddy Head is the most easterly point of the United States and is well up in the Bay of Fundy. The basin referred to by Captain Myers is a bight or bend in the shore of Quoddy Bay, and the distance across in a straight line from the station is about one mile or less. His house is about one mile and a half, in a straight line, from the station. The Weather Bureau station at Eastport is about 8 miles north of Quoddy Head, and the observer reports at 8 a. m. southerly winds with snow, temperature 32°, but at 8 p. m. northwest winds cloudy, temperature 34°.

The weather map shows that in the interior of New England, New Brunswick, and Quebec, the temperature during the day was decidedly below freezing, but off the coast a little above freezing. A region of colder, dry, northerly winds was slowly pushing aside the region of warm southerly, and at the border between these snow was falling. The movement of this border region was evidently so slow that Eastport and Quoddy Head remained within it nearly all day.

A LOCAL SQUALL AT WEST BERKELEY, CAL., DECEMBER 11, 1894.

Mr. W. H. Hammon, local forecast official, and Mr. H. E. Smith, inspector, Weather Bureau, have made a special examination of the so-called "Cyclone or Tornado," which occurred on December 11 at a point about 5 miles northeast of the station at San Francisco. A comparatively small amount of damage was done, and there was evidence of several eddies in the neighborhood of the large building occupied by the soap works, but there was no clear evidence of a general whirl, such as is supposed to characterize the ideal tornado. There was a sudden shift of high wind from southwest to northwest, the record at the Weather Bureau station being as follows:

9.25 to 9.30 a. m. (90th meridian time), southwest, maximum velocity, 34 miles; 9.30 to 9.35, west, maximum velocity, 24 miles; 9.35 to 9.50, west; during the remainder of the day, between west and southwest. The barometer at 9.25 read 29.97 and rose about 0.02 during the squall, and then remained stationary. The temperature fell from 56° to 51° at the same time.

At the location of the squall in Berkeley a very black cloud was seen to approach with heavy rain, coming over the hills from north to northwest, but it is not likely that there was any funnel-shaped appendix to this cloud. The damage was confined to a narrow straight path about 100 feet wide and half a mile long. Mr. Hammon concludes "that the storm was merely a squall resulting from the changing of direction of the wind from southwest to northwest; at the point of meeting of the two masses of air moving in those directions the air must be forced forward in a resultant direction."

In the region between the opposing systems of wind and, in general, whenever a colder northwest pushes under a warmer southwest wind there is a narrow intermediate belt in which no wind is felt for a few moments. Within this region big cumuli are often formed, beneath which waterspouts and tornadoes sometimes develop. The strongest argument for considering the present squall as a tornado is drawn from the statement made by one observer that the atmosphere was perfectly at rest on either side of the path, but this testimony is not confirmed by others. The debris of buildings and lumber were not carried up into the air to any great extent. The squall of wind did its damage immediately after, and in connection with, a heavy downpour of rain, and the dark cloud accompanying the rain was seen approaching at a distance across the San Pablo Bay, but the evidence seems all in favor of the conclusion that the cloud and rain were not due to an ascending current, but rather to a cold descending mass of air that was producing rain by mixture with the warm surface air. Objects were, of course, often carried up a little ways above the earth by the rushing air, but not to any such height as is common in the case of the tornado proper. One observer remarks that the violent northwest wind rushing in from the sea brought along many seagulls that had been unable to stem the torrent of wind, and that he saw them whirled around in the cloud like fragments of wood.

At this time the center of low No. V was moving northeastward in British Columbia, and the inflow of colder northwest wind in its rear produced this local gust at West Berkeley. Whatever of the attributes of the tornado this storm may have had, it was certainly not developed to any great extent, and can hardly be called even an incipient tornado.

LOCAL STORMS ON THE WEST COAST OF MEXICO.

Mr. G. O. Rogers, Forest Grove, Oreg., communicates the following description of a circular storm observed by him off the Pacific coast of Mexico, about 15 miles from the land:

For at least two hours before and during the existence of the meteor and for some time subsequently there was a perfect calm. The ocean toward the land and to all other points of compass, as far as the vision could reach, was as smooth as a mirror, save the unruffled pulsating swells of the water. It was in the month of March, about 9 a. m., and the sky was perfectly clear, except about twenty-five degrees above the horizon. A little below the sun, eastward from the ship and toward the land, a peculiar cloud was observed, apparently lying perfectly horizontal. It seemed to be from three to four feet in diameter, as straight as a ship's mast, with uniform thickness throughout its length, extending from one to two miles across the sky from north to south. Almost immediately after this cloud had assumed shape there appeared attached to its under surface at irregular intervals pendant clouds, suspended at right angles, pointing to the water below. The horizontal cloud resembled a long roll of dark wool, while from its fibrous mass ravenous spindles were twisting their threads. Immediately the pendant directly in front and nearest our point of view began to elongate with marked rapidity, also to increase in diameter as well, extending itself to nearly one-half the distance to the water below and assuming the shape of an inverted Apollinaris bottle, with the bottom slightly enlarged at the point of contact with the parent cloud. Neither this pendant nor any of the others remained of the same length for any considerable time, but continued to advance and retreat with more or less activity. At this juncture, about six hundred yards from the ship and directly under the large pendant, was observed an active disturbance in the water, which rapidly grew into a whirling spray, increasing in volume, height, density, and activity until the spray became a smooth, revolving, hollow cone of water, quite like an inverted glass funnel, the point of which shot upward with lively motion, while at the same time the point of the pendant above came as rapidly downward until the two met in midair about two-thirds the distance from the horizontal cloud above to the ocean below. At this time the meteor was in its greatest activity. The points remained in contact for from five to eight minutes, when they parted, the yet whirling water slowly receded, resolving itself into spray, then agitation of the water and a final calm, the pendant cloud retiring in the same manner. During all this time the several miniature pendants kept up an active elongating and receding motion on a small scale, under neither of which was observed any disturbance in the water below. Soon all pendants retired and the horizontal cloud slowly disappeared. From the first notice of the phenomenon until it disappeared was about one hour. It is important to mention that the revolving motion of the spray and the water were with that of the sun or the hands of a clock. There could have been no disturbing currents of air from the upper surface of the horizontal cloud to the water below, for the cloud lay as still as a log and none of the pendants were swayed in the least from the perpendicular.

It is obvious that different currents of air, either as an initiative or as an incidental factor, must be abandoned in the development of our little meteor, and some other cause must be assigned to account for its existence.

PHOTOGRAPH OF A MOUNTAIN SHADOW.

The shadow cast by Mount Diablo, 40 miles east of Berkeley, Cal., is visible, at sunrise as a triangle thrown against the mists and distant mountains to the westward and, owing to its isolated situation, the shadow is sometimes seen with remarkable distinctness and is associated with many superstitious fancies. A photograph of this shadow was taken by J. J. B. Argenta of San Francisco. The right-hand side of the shadow is said to usually show a pale yellow tint on the inside and a pale green on the outside border; the left-hand side of the shadow shows only a reddish tint; the central portion of the shadow is a blue-black. These interesting colors still await a satisfactory explanation.

THE FLOOD IN THE COLUMBIA RIVER.

In May and June, 1894, a remarkable flood occurred in the Columbia River, some details of which are given in the REVIEWS for those months. The following additional items are taken from a recent report of the Chief of Engineers. The upper river gauge at the cascade's lock and canal had recorded 139.7 as the maximum high water of 1876, and the highest on record up to that time. In June, 1894, the maximum reading was 145.7, or 6 feet above the maximum of the year 1876, and it continued above for fifteen days. The occurrence of this unusual high water makes it necessary to increase the height of the embankments protecting the canal and provision will be made for a possible future flood reading of 152 feet on this gauge. During the last two years the daily steamer from Portland has ascended to the Cascade Canal when the river stage has been 36 feet or less above low water; on a falling river the daily trips have been resumed at about the same stage of water. When the river stage exceeds 42 feet the currents over the rapids, below the canal, become too strong for steamers to ascend. A table has been prepared showing the number of days each year for the last fifteen years that the stage has been between 20 and 42 feet above low water on the lower gauge. This table shows that the river was between these limits on an average of ninety days each year.

REPLIES TO CORRESPONDENTS.

Do winds on striking mountain ranges undergo reflection like elastic solids, or do they tend to produce a vacuum and follow the range like small currents of air blown obliquely against the surface of a table?

The wind follows the surface of the ground like the air in the experiment alluded to and does not rebound like a ball; similar phenomena may be observed in a broad stream of water. If in such a stream some obstacle be placed imitating a range of mountains, such as a gently slanting stone or plank, the liquid will be seen to glide up over the windward slope and descend on the leeward side, following the surface of the stone or plank as closely as practicable. On the windward side the liquid hugs the surface very closely, but

on the leeward side it is very apt to leave the surface if the slope is too steep or the curvature too sudden. The motion of the liquid layers close to the stone or plank affects the movements of the layers above them, so that even at the surface of the water we see a mound or the crest of a wave just above the obstacle, while lower down stream this wave repeats itself a number of times, forming what is called a standing wave, growing smaller and smaller until it finally disappears. An analogous phenomenon occurs in the atmosphere on the leeward side of a mountain range, but as the winds are much more violent than the currents of water the air is thrown into a series of complete revolutions, forming rolls of clouds separated at regular distances from each other like the standing waves of water.

An analogous phenomenon is also produced when the wind blows past a vertical pole or chimney, or when water flows past the piers of a bridge. The fluid follows the obstacle on its windward side, but by the time it has been deflected round to the leeward side the inertia of its onward movement carries it forward, so that it does not follow the leeward side of the obstacle as closely as it did the windward side. There is consequently a space of dead air or water in the rear; beyond this, where the right-hand and left-hand currents come together, there are formed many whirls which may become visible as clouds, if the obstacle is a chimney from which smoke and steam are issuing, but are more frequently quite invisible to the eye. If the obstacle is a flagstaff then the currents on the right and left meet behind the staff but include the flag between them, which serves as a dividing surface, and what would have been a series of whirls in the free air now becomes a beautiful series of ripples running along with the wind over the surface of the flag.

As to the vacuum produced by the wind on the leeward side of a mountain range it is known that there is a tendency to produce a slight diminution of barometric pressure, but this is ordinarily too slight to be spoken of as a vacuum, and its amount depends upon the shape and size of the mountain, the velocity and direction of the wind, and especially the location of the observer. If one blows across the open end of a hollow reed he may make a whistling note, but every one knows how difficult it is to blow in the right direction so as to get the best result. When the wind blows against a vertical cliff of rock there is a small space on top of the cliff where there is almost no wind and a diminished barometric pressure, but this is a very local effect; it does not extend far away from the cliff, and it is possible that this is not the phenomenon referred to by our correspondent in his question quoted at the head of this article.

When a small jet strikes a plane surface almost perpendicularly, and spreads out in all directions, or when one blows strongly between two parallel sheets of paper, the layer of rapidly-moving air has within itself a barometric or elastic pressure that is lower than it was within the jet. This is due to the fact that the elastic pressure which it first had has been partly consumed in giving increased motion. If the flow of the atmosphere against a mountain slope were similar to the movement of a small jet against a plane table, then there would be a diminution of pressure in the former just as in the latter case. But such comparison is quite misleading when applied to the ordinary phenomena of the wind since in this case we have a comparatively small obstacle and a much larger volume of wind. The principal diminutions that occur are at the top of a mountain cliff, and on the leeward side of a mountain range.

What is the origin of cold waves; do they depend on the moon?

In reply to this query it should be stated that the origin of cold waves is considered to be not yet established with all the certainty that we may hope to attain eventually. The cold winds that blow upon us in the temperate zones are certainly experienced as far north as Manitoba and Saskatchewan, but north of that, although the air is very cold, yet the winds do not seem to be so severe, and there is no certainty as yet whether our winds are to be regarded as horizontal outflows of cold air from Siberia northward over the Arctic Sea and southward over British America, or whether they consist of descending air that has passed northeastward over the Rocky Mountains into British America, where it has cooled off and turned southward. In either case it has never yet been proved that the moon has anything to do with these cold waves. If there is a lunar tide in the atmosphere, as suggested by some, then there ought also to be a solar tide just as there is in the ocean, but neither of these has as yet been observed. It does not seem likely that the solar or lunar tidal action can be very important, and, in fact, the cold waves, as studied on the daily weather charts of the whole Northern Hemisphere, evidently have most to do with the great areas of low pressure on the Atlantic and Pacific oceans, and the great areas of high pressure over Asia and America.

What is the shape of the index of the minimum thermometer and in what manner does it permit the fluid to pass up the tube and yet allow itself to be pushed back?

The index of the minimum thermometers used by the Weather Bureau is a piece of dark-colored glass rod about three-fourths of an inch long and of very small diameter. When being made the end of the small fragment is applied momentarily to a gas or lamp flame; the glass softens and draws itself up so as to form a smooth rounded knob, similar to the head of a pin, but more rounded. In most cases the index is provided with a knob at each end, and then resembles a dumb-bell with a long handle between the balls. If a knob is formed at one end, as is sometimes the case, the index is placed in the tube so that the knob comes next to the end of the liquid column. The form of the index is seen distorted when examined through the stem of the thermometer, which magnifies the lateral dimensions.

The index of any particular thermometer always fits quite loosely in the narrow tube, so that there is plenty of space for the flow of the liquid around the knobs on the ends of the index. As the normal position of the minimum thermometer is horizontal no motion of the index takes place as long as the latter is wholly surrounded by fluid. When, however, the end of the liquid column by contraction reaches the knob at the end of the index a new kind of action takes place, and to explain this we must first consider the nature of the surface films. The surface of every liquid is, in fact, like a most delicate film of stretched skin. This invisible film, of exceeding thinness, exists not only where the liquid is separated from the air or other gaseous space, but also at any surface of contact between the liquid and another substance. The strength of the film varies with the nature of the two substances that are separated by it. Delicate films of this kind can exist separate from the mass of liquid and are familiarly known to every one in the exquisitely-colored soap bubbles.

In the minimum thermometer we have to consider (1) the stretched surface film, visible at the end of the liquid column, which clings to the sides of the thermometer bore and is drawn toward the bulb as the thermometer cools; (2) the invisible film that completely envelopes the index itself. When the visible surface film has been drawn down the tube so as to touch the invisible index film these two films do not unite, nor do they penetrate each other, but preserve their identity, and push against each other until the curvature of the surface film is altered by the pressure of the index film and receives a slight dimple, resembling the effect of a finger-tip pressed against a stretched sheet of rubber. This alteration

in the surface film brings into action a small but sufficient force, that steadily presses the index film and its inclosed index backward as far as the surface film may go. When this backward movement ceases and the column of liquid ascends the tube, the surface film simply moves forward away from the index, around which the liquid is free to flow.

METEOROLOGY IN THE SCHOOLS.

It is very desirable that both the voluntary and the regular observers, and indeed all who are interested in the work of the Weather Bureau, should do their best to stimulate the proper study of meteorology in the public and private schools throughout the country. Even the ordinary district schools of the country, which find time for reading, writing, arithmetic, geography, history, and physiology, might well afford to teach something about the weather, the climate, and the weather map and its predictions. No one can be a good farmer without being a close observer of everything that affects his crops and his farm. Prof. Wm. M. Davis, of Harvard College, says:

> Meteorology fairly deserves a higher place in general teaching than it now receives. It is a subject of great popular interest and importance. We live in its midst; examples of its processes are always with us. In its more elementary presentation it involves excellent opportunities for observation and record, such as help to train a child in habits of accuracy and neatness. The understanding of nature thus gained goes far toward clearing away some of the longest-remaining superstitions of the darker ages. Both in information and training, meteorology may claim a high place in the science of education. A few intruments, a series of daily weather maps, such as are now readily obtainable from the stations of our Weather Bureau, and a well-prepared teacher, will go far toward overcoming the deficiencies of the text-book in use. If the teacher has the courage to discard the text-book as a guide, and use it only as a reference book, let him begin at once with the weather maps, and explain in simple language the meaning of the signs of clear, fair, and cloudy weather, rain or snow, wind and calm, warm and cold. Pressure follows in the second lesson, while humidity had best be omitted until a later chapter. A blank map, on which the record for some interesting example of varied weather can be entered, may be filled out on the wall before the class. Omit the isotherms and isobars at first. Ask the class to describe the distribution of the varions weather elements over the country.

The general committee appointed by the "National Educational Association" to consider the subject of studies in secondary schools reported as follows:

> *Meteorology.*—Since the establishment of the National Weather Bureau meteorology has not only been greatly advanced as a systematic science, but has become a subject of wide popular interest. This, together with its importance as a factor of geography, moves the committee to recommend that meteorology be introduced as an elective study for half a year in the third or fourth year of the high-school course, when practicable. It should be opened by local observations of the passing weather changes, accompanied by a study of a series of daily weather maps, and the application of physical principles to explain the general phenomena of the atmosphere should follow. Local observations should be carried further in this course than they extended in years, especially regarding the sequence of phenomena in the atmosphere and the correlation of various weather elements. The study of weather maps, already familiar objects from the less systematic study of earlier years, should now reach to the clear understanding and description of the distribution of temperature and pressure, flow of the winds, and occurrence of clear, cloudy, rainy, or snowy areas.

Copies of the complete report on this subject can be had from the U. S. Bureau of Education, and should be in the hands of every teacher in the country. Both the regular and the voluntary observers of the Weather Bureau, who can give intelligent talks on the weather to the schools in their neighborhood, should seek opportunities for so doing.

THE ORIGIN OF STORMS.

The questions are often asked: "What is a storm? How does it originate and grow, and which of the many so-called theories is now recognized by meteorologists?" In reply to such questions the Editor would express his conviction that there is considerable truth in many of the explanations that have been propounded from time to time, and that it is not advisable or necessary to reject all of these as unnatural, although we may say that no special one explains all the great variety of storms that are shown upon the weather maps. It would be more correct to acknowledge that some one feature is more prominent in one class of storms, while other features may be common to other classes, and no single hypothesis applies to all storms alike. The following different explanations have been offered from time to time as to the origin and maintenance of storms:

1. The surface winds may be described as respectively polar and equatorial, and such systems exist simultaneously side by side. Within the main body of the equatorial system the air is warm, moist, and clear, but hazy, and within the polar system, cold, dry, and very clear, with blue sky. Between the polar system on the west and the equatorial on the east, a series of whirls is formed, constituting the larger whirlwinds or hurricanes; on the other hand between the polar system on the east and the equatorial on the west are formed the smaller thunderstorms and hailstorms and perhaps tornadoes and waterspouts. Considered as a description of the general geographical relations of the winds and storms this agrees fairly well with nature, but in so far as this statement implies the idea that the whirling movements are directly caused by the interference of the northerly and southerly currents as they go past each other this theory is quite unsatisfactory. The interference of parallel currents in opposite directions may cause small whirls like those in the water below a bridge pier or the dust whirls behind buildings and trees, but it can not alone of itself form the great whirls of cyclonic storms.

2. Where an extensive area of the earth's surface is abnormally warm the lighter layer of air in contact with it has a tendency to rise, and when once this ascent is under full headway and the surrounding denser air is flowing inward to take its place, the atmospheric motions follow an incurving ascending spiral whirl. This is apparently sometimes the origin and mechanism of the large dust whirls that originate on still, quiet afternoons. It is also the phenomenon seen in the atmosphere over an extensive fire. A certain class of thunderstorms apparently originates by the ascent of moist, light air, but it is carrying the analogy too far to consider hurricanes and similar extensive storms as originating in this manner, since in these storms the ascending movement and the vertical dimensions are small in comparison with the horizontal movement and dimensions.

3. When a region of southerly winds exists on the eastern side of a region of northerly winds the intermediate space will show a diminished atmospheric pressure, owing to the combined action of these winds and the rotation of the earth; the intermediate air will therefore tend to expand, possibly forming clouds and rain by the cooling due to expansion; the evolution of latent heat perpetuates the clouds and the updraught, so that the northerly and southerly winds may be deflected inward and a cyclonic circulation be set up, which will be maintained as long as the formation of cloud and rain continues.

4. The great inequalities of topography on a land surface and the great differences between the land and the water surfaces cause corresponding differences in the distribution of temperature and moisture throughout the superincumbent air and in the resistances to the motions of the atmosphere. Consequently the ideal general circulation for a smooth earth's surface is broken up into several large systems of circulation, and these frequently interfere with each other, producing what are called areas of low pressure (meiobars) and areas of high pressure (pleiobars), which vary decidedly in their extent and position from day to day and season to season. The meiobars of Bering Sea and of Iceland, the pleiobars of the tropical Atlantic and Pacific, and the meiobars of the equatorial region illustrate these great centers of atmospheric movements. When a corner or small portion of a meiobar becomes isolated or greatly displaced and the air from the neighboring pleiobars

flows in to fill it up a whirl is generally started and the barometer falls still lower, owing to the centrifugal force of the rotating air. If the whirl starts in the wrong direction it is soon checked by resistances and the rotation of the earth; if otherwise, the combination of local centrifugal force with the deflection due to the rotation of the earth on its axis maintains the whirl and suffices to explain the low barometer in the cyclonic system. The inflow and general movement of the air would soon cease by reason of inertia and resistances were it not that an effective force is produced by the latent heat evolved in the condensation of vapor and by the action of the solar heat on the tops of the clouds. Whatever tends to diminish the density of the central mass of air, thereby increasing its buoyancy and the inflow of the air from the outside, contributes to the rotary motion, to the diminished pressure, and to the continuance of the disturbance.

5. Owing to the mobility and slight viscosity of the air strong winds may exist in one region without affecting the movements in adjacent regions, but when the moving layer of air is a short distance above the earth's surface its effect upon the lower atmosphere, though indirect, may be important. If a cyclonic rotation exists only at some distance above the earth, the diminution of pressure in the upper strata will occur as in the preceding case. The lower strata must, therefore, expand and ascend. Rotatory motion may arise in the lower strata by the communication of rotation from the upper currents downward, or it may originate in the lower current itself. Here, again, the rotation and diminished pressures will continue so long as the formation of cloud and rain continues to disturb the distribution of heat.

6. The flow of air from a pleiobar into a meiobar may take place under such circumstances that the inflowing air is pushed up over a table-land or mountain range; this enforced ascent being accompanied by cloud and rain or snow, the resulting air flowing down on the leeward slope of the range is drier, and by descent becomes warmer than before—*i. e.*, a fœhn. But this dynamic heat is soon lost by radiation or partially consumed by the evaporation of water from the earth's surface, and gradually the descending air becomes cooler, damper, and denser than in the fœhn stage. It is now in condition to push southward under the influence of the centrifugal force of the earth's rotation, and eventually to underrun and lift up the warmer, damper, and lighter air which opposes its progress; in this way a new center of cloud and precipitation, a new thermal disturbance, and a new storm center are formed. This appears to be the ordinary occurrence on the eastern slope of the Rocky Mountains.

7. When a current of denser air (the density may be due either to dryness or temperature) flows over a steep declivity into the lowlands, and especially into the ocean, the denser air sinks, while the lighter air below is pushed up; in this way a series of severe gusts are formed, which usually are felt in a well-defined band some distance off the leeward side of the highlands. Such winds are called falling winds, and the resulting gusty storms are illustrated by the "Bora" of the Black Sea and Adriatic; the "Papagayo" or "Papagallo," and the "Tehuantepec" (peculiar to the gulfs of those names, and, indeed, to many portions of the west coast of Central America, and which are essentially northeast winds in the winter season); the "Tapayaguas," which are essentially southwest winds producing squalls during the summer season on the east side of the Central American Peninsula; and the tornadoes, or white squalls, off the west coast of Africa.

8. It is plausible that from one cause or other a series of waves may be set in motion, moving nearly horizontally through the atmosphere; especially will this happen at the dividing surface separating a lower layer of dense air from an upper layer of lighter air. When the trough of such a wave passes over a region of warm moist air the pressure upon this warm layer is appreciably diminished, and during the short time that this diminished pressure lasts there may take place an expansion, an ascent, and even a formation of cloud sufficient to initiate a general upward motion and determine the development of a storm.

9. When a layer of moist air is overlaid by a very clear sky the intense nocturnal radiation may cause the formation of a layer of fog, so that during the rest of the night the air beneath this surface is on the average warmer than some adjacent atmosphere at the same level. This disturbance in the distribution of heat is intensified, after sunrise, by the fact that all the sun's heat is stopped at the upper layer of the fog surface, and in dissipating the latter there arises a still further tendency in the mass to ascend and form a special storm center.

10. When the surface of the earth is covered by a rather extensive system of southwest winds, within which special or local ascending currents are formed wherever the wind strikes any obstacles, each of these ascending currents is likely to persist for a considerable time, and even until it reaches the level at which cumulus cloud is formed. Thus, the country becomes dotted over with cumuli, some of which will undoubtedly continue developing until they attain large dimensions, and possibly produce rain or hail; if the condensation within the cloud takes place under proper circumstances, about which, however, we know very little at present, lightning and thunder will be evolved and a characteristic thunderstorm produced.

11. The frequent electrical manifestations that occur in storms have led to the hypothesis that electricity is essential to their existence, and perhaps even to their origination. We have, therefore, to enumerate among the theories that which may be called the electrical theory of the origin of storms, but this is, at present, in an indefinite or chaotic condition, owing to our ignorance of the origin and functions of electricity in the atmosphere. We may only at present recognize the possibility that in rare cases electricity may be an important agent in producing storms.

12. If we consider the great variety of disturbances, large and small, we shall find that the well-developed cyclonic system is the exception rather than the rule, and if we consider the causes that contribute to the distortion of the circular isobars into ovals, elongated V's, and even parallel or trough-like systems, we shall find that not only the resistances due to the topography of the land come in play, but that frequently the troughs may be best explained as caused by a rapid motion of a cyclonic disturbance which affects the upper atmosphere but has not time to set the lower air into corresponding motion. The relation between the motions in the upper atmosphere and those of the lowest layers depends upon the extent of the upper disturbance and upon the time available to communicate downward to the earth's surface. When the movement of the storm center is comparatively slow the upper and lower systems of isobars are apparently parallel, and the axis of the ideal whirlpool is less inclined to the vertical, but when the movement of the upper disturbance is rapid the axis departs greatly from the vertical until finally all semblance of a horizontal system of wind rotation disappears and with it the central barometric depression, thus a waterspout or tornado which stands vertical at one portion of its route may be nearly horizontal at another, the pictures given by Baddeley, in his "Dust Storms of India," afford several illustrations of the great distortion that a whirl may experience and still remain a whirl without being a cyclone. Barometric troughs with whirls at the end moving rapidly in the direction of the trough are frequently shown on the weather map.

TABLE I.—*Climatological data for Weather Bureau Stations, December*, 1894.

Districts and stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.								Humidity and precipitation.				Wind.				Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Mean temperature data since opening of station.			
			Mean pressure, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01 or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.				Highest for month.	Year.	Lowest for month.	Year.
New England.						33.1	— 0.2										4.33	+ 0.8												
Eastport	76	22	29.98	30.07	+ .10	27.4	+ 0.1	51	27	34	— 1	24	21	38	19	70	2.17	— 2.1	9	9,253	nw.	60	ne.	27	6	13	12	6.5	33.0	1891	17.6	1890
Portland	103	23	29.97	30.08	+ .06	27.0	— 0.6	55	15	34	2	30	20	29	21	78	1.75	— 1.8	8	5,701	nw.	36	ne.	27	11	13	7	4.6	37.0	1881	17.0	1890
Northfield	872	8	29.13	30.13	+ .08	21.8	+ 0.2	49	*	30	—22	30	13	42	14	74	3.40	+ 0.4	11	6,181	sw.	46	sw.	13	8	15	8	5.5	30.6	1891	8.9	1890
Boston	135	25	29.98	30.12	+ .07	32.2	— 0.5	55	16	39	8	*	26	22	23	72	4.28	+ 0.8	10	8,465	w.	50	ne.	27	9	12	10	5.4	40.4	1891	21.9	1876
Nantucket	14	9	30.11	30.12	+ .06	36.2	+ 1.1	56	12	41	11	29	32	21	30	79	5.83	+ 2.4	14	9,000	n.	48	se.	27	11	8	12	5.5	41.4	1891	31.1	1890
Woods Holl		17				34.6	— 1.8	56	12	40	11	29	29	25			5.63	+ 2.4	11	11,252	nw.	72	sw.	27	12	8	11	5.2	41.5	1881	28.0	1876
Vineyard Haven		9				36.4	+ 1.0	59	12	46	13	29	31	26			6.87	+ 4.2	11		nw.				11	6	14		43.8	1891	31.9	1890
Block Island	37	15	30.10	30.13	+ .07	36.7	— 0.5	57	12	42	11	29	31	30	28	73	5.22	+ 1.3	11	12,908	nw.	68	e.	27	12	11	8	5.0	42.2	1881	31.4	1890
Narragansett Pier		13				33.3	+ 0.5	56	12	42	7	29	25	30			3.89	— 0.1	9		nw.				17	4	10		40.9	1891	25.8	1892
New Haven	107	23	30.01	30.13	+ .04	32.1	— 0.4	56	17	39	3	28	25	27	23	73	3.33	— 0.3	9	7,102	n.	41	ne.	27	15	9	7	4.4	39.2	1891	20.3	1872
New London	45	24	30.10	30.15	+ .08	33.4	— 1.1	56	17	40	8	29	26	27	28	86	5.25	+ 1.8	8	5,643	nw.	39	ne.	27	10	14	7	5.0	40.0	1889	23.7	1872
Mid. Atlantic States.						33.0	+ 0.3										3.42	+ 0.1												
Albany	85	21	30.05	30.15	+ .07	29.0	— 1.3	52	16	36	— 6	30	22	31	24	84	3.18	+ 0.4	10	5,496	s.	34	w.	13	12	7	12	5.7	38.7	1881	17.2	1876
New York, N. Y	185	25	29.94	30.14	+ .04	36.8	+ 1.0	57	12	43	7	29	30	25	27	73	5.23	+ 2.0	10	8,061	nw.	40	ne.	27	7	14	10	5.7	41.8	1891	25.1	1876
Harrisburg	377	7	29.75	30.18		34.4	0.0	55	15	40	4	29	29	22	28	82	3.34	+ 0.1	13	5,651	w.	36	nw.	27	*9	13	9	4.8	40.2	1889	29.4	1890
Philadelphia	117	24	30.03	30.16	+ .03	36.9	+ 1.1	56	16	43	7	29	31	21	28	74	4.03	+ 1.3	10	7,490	nw.	36	nw.	27	10	11	10	5.1	43.6	1889	25.1	1876
Atlantic City	53	22	30.10	30.15	+ .04	38.0	+ 1.2	56	17	44	8	29	32	29	32	84	1.71	— 2.2	10	8,710	n.	48	nw.	13	13	5	13	5.4	43.6	1889	26.9	1876
New Brunswick						34.9		58	16	42	5	29	28	26			4.61		10		nw.				6	17	8					
Baltimore	179	24	29.96	30.16	+ .02	37.7	— 0.8	59	16	44	8	29	32	25	28	71	4.12	+ 1.0	11	5,054	nw.	36	nw.	27	12	13	6	4.5	46.0	1889	28.4	1876
Washington, D. C.	112	25	30.06	30.18	+ .02	37.4	— 0.4	60	16	45	6	29	30	30	28	75	4.15	+ 1.2	11	4,632	nw.	34	nw.	27	14	8	9	4.7	45.6	1889	26.5	1876
Cape Henry		21				43.9	+ 1.1	72	12	51	14	29	36	30			2.69	— 1.5	7		sw.				4	19	8		52.4	1889	34.1	1876
Lynchburg	685	24	29.43	30.20	+ .04	40.8	+ 0.9	65	15	50	7	29	32	35	30	73	3.44	— 0.1	11	3,221	sw.	25	nw.	27	12	10	9	5.1	50.6	1889	29.9	1876
Norfolk	57	24	30.11	30.18	+ .04	44.6	+ 0.4	72	12	52	13	29	37	27	36	79	2.28	— 1.4	10	6,307	w.	38	sw.	27	17	9	5	4.0	51.4	1889	33.2	1876
S. Atlantic States.						49.5	+ 0.6										2.12	— 1.7												
Charlotte	773	17	29.34	30.19	+ .02	43.8	— 0.1	69	2	52	2	29	36	26	34	74	4.30	— 0.4	10	5,072	sw.	32	sw.	12	14	7	10	4.8	54.7	1889	38.1	1878
Hatteras	11	15	30.16	30.17	+ .03	50.1	+ 1.9	73	12	55	17	29	46	21	45	85	4.57	— 1.4	10	11,515	n.	54	nw.	29	9	14	8	5.3	54.6	1889	41.1	1880
Kittyhawk	9	20	30.13	30.14	+ .05	47.3	+ 2.2	73	12	53	14	29	42	23	41	83	2.74	— 1.6	10	12,382	ne.	48	ne.	3	10	8	13	5.7	54.0	1889	36.3	1876
Raleigh	388	8	29.77	30.20	.00	43.6	+ 0.4	71	2	52	10	29	35	29	35	78	2.46	— 0.3	13	4,812	sw.	24	nw.	28	12	9	10	5.0	53.4	1889	40.0	1892
Wilmington	78	24	30.10	30.19	+ .03	49.0	— 0.2	74	9	57	14	29	41	31	39	78	0.78	— 2.7	8	5,676	nw.	46	w.	26	15	6	10	4.2	56.0	1889	38.6	1876
Charleston	52	24	30.17	30.22	+ .06	52.4	+ 0.5	73	2	60	14	29	45	23	43	78	0.44	— 3.2	2	5,168	ne.	37	w.	26	16	11	4	3.7	60.0	1889	43.4	1876
Columbia		8				48.8	+ 0.3	75	11	58	9	29	40	33			2.29	— 0.8	10		nw.				12	8	11		58.0	1889	45.9	1888
Augusta	209	23	30.01	30.24	+ .05	48.4	— 1.1	73	11	58	9	29	39	35	40	80	2.15	— 1.6	8	3,296	nw.	28	nw.	27	16	6	9	4.2	57.4	1889	38.5	1876
Savannah	98	24	30.10	30.21	+ .03	53.6	+ 0.7	78	12	63	12	29	44	26	44	79	0.65	— 2.9	3	5,772	nw.	32	nw.	28	17	9	5	3.7	59.8	1889	44.0	1876
Jacksonville	43	24	30.15	30.20	+ .04	57.7	+ 1.0	80	12	67	14	29	49	31	47	78	0.81	— 2.3	3	4,922	ne.	32	s.	12	12	11	8	4.9	62.2	1879	48.4	1876
Florida Peninsula.						64.8	— 1.0										0.62	— 1.8												
Jupiter	28	7	30.12	30.15		66.0	— 1.6	80	12	72	24	29	60	23	58	80	0.99	— 0.9	10	7,825	nw.	29	nw.	28	12	13	6	4.7	70.6	1891	63.4	1888
Key West	22	25	30.13	30.15	+ .03	69.4	— 0.9	81	12	73	44	29	66	13	62	81	0.26	— 1.6	2	9,500	ne.	39	n.	29	19	8	4	3.3	74.4	1879	64.7	1885
Tampa	36	16	30.15	30.19		62.2	— 0.6	80	11	71	19	29	53	37	55	86	0.54	— 2.1	5	4,223	n.	25	nw.	28	14	13	4	4.7	65.8	1891	52.8	1885
Titusville	44	8	30.15	30.19		61.8	— 0.7	81	12	69	18	29	54	25	54	84	0.68	— 2.5	4	8,562	nw.	36	e.	12	20	9	2	2.5	66.2	1891	57.6	1888
Eastern Gulf States.						52.9	+ 1.1										3.74	— 1.1												
Atlanta	1,131	17	29.00	30.23	— .03	46.2	+ 0.9	69	2	54	4	29	38	26	38	80	3.45	— 1.2	11	7,548	nw.	40	se.	12	16	7	8	4.5	57.2	1889	40.6	1878
Pensacola	56	16	30.14	30.20	+ .04	56.0	+ 0.7	75	9	64	14	29	48	30	48	79	1.45	— 3.3	10	6,960	ne.	36	sw.	26	18	6	7	4.2	62.0	1889	50.5	*
Mobile	57	24	30.16	30.23	+ .06	53.8	+ 1.0	73	11	62	16	29	45	27	47	86	4.42	— 0.1	9	6,196	n.	31	nw.	26	17	12	2	3.4	61.0	1889	43.8	1876
Montgomery	257	23	29.94	30.22	+ .04	51.6	+ 1.1	75	2	61	13	29	42	32	43	79	4.73	— 0.3	11	4,483	nw.	35	s.	10	15	6	10	4.6	59.1	1889	41.4	1876
Meridian	358		29.82	30.22		48.6		75	2	59	9	29	39	37	41	83	3.65		11	4,259	n.	26	s.	10	14	7	10	4.6				
Vicksburg	254	24	29 93	30.20	+ .02	52.0	+ 1.7	76	8	61	15	29	43	28	41	73	6.41	+ 1.2	12	5,096	n.	29	nw.	28	13	10	8	4.7	63.6	1889	40.1	1876
New Orleans	54	25	30.15	30.21	+ .07	57.8	+ 1.3	81	8	66	21	29	50	31	49	77	2.01	— 2.7	10	6,547	n.	35	n.	28	17	8	6	3.5	64.3	1889	47.8	1870
Port Eads						60.4		75	*	64	30	28	57	21			0.91		4		n.				15	10	6					
Western Gulf States.						52.2	+ 1.7										2.13	— 1.6												
Shreveport	249	24	29.93	30.20	+ .04	51.2	+ 1.9	77	8	59	11	28	43	31	41	75	2.97	— 2.0	10	4,971	s.	28	se.	9	12	8	11	5.3	63.2	1889	40.9	1876
Fort Smith	492	13	29.69	30.23	+ .07	43.6	+ 0.4	73	7	54	3	28	34	37	34	72	2.51	— 0.6	8	4,743	e.	27	e.	9	14	7	10	4.5	57.8	1889	36.1	1886
Little Rock	302	16	29.88	30.22	+ .05	45.2	0.0	70	21	53	10	28	37	30	34	71	3.95	— 0.4	10	5,130	nw.	38	n.	2	12	3	16	6.0	59.1	1889	37.4	1886
Corpus Christi	20	8	30.17	30.19	+ .05	61.4	+ 4.3	81	9	68	26	28	55	25	57	91	0.64	— 1.4	2	7,719	n.	36	nw.	26	10	14	7	5.2	68.4	1889	52.6	1887
Galveston	42	24	30.18	30.22	+ .08	58.8	+ 0.8	77	8	64	21	28	54	24	50	78	0.72	— 3.9	6	8,308	ne.	40	nw.	26	19	4	8	3.8	66.4	1889	50.2	1876
Palestine	510	13	29.66	30.22	+ .05	53.0	+ 2.6	81	8	64	8	28	42	34	41	72	1.98	— 1.6	10	4,676	s.	28	w.	9	7	16	8	5.8	64.0	1889	45.1	1884
San Antonio†	679	16	29.51	30.23	+ .08	58.0	+ 3.2	84	8	68	20	28	48	32	37	55	0.04	— 1.7	1	4,450	se.	31	nw.	25	12	16	3	4.0	66.0	1889	49.0	1878
Ohio Val. & Tenn.						39.2	+ 0.8										3.90	+ 0.3												
Chattanooga	762	16	29.40	30.23	+ .04	44.6	+ 0.8	68	22	52	5	29	37	33	35	74	6.45	+ 1.9	14	4,996	s.	35	w.	26	8	13	10	6.0	57.2	1889	37.5	1880
Knoxville	980	24	29.14	30.23	+ .03	42.2	+ 1.5	66	10	50	2	29	34	30	34	77	6.26	+ 2.1	14	3,676	sw.	34	sw.	10	12	7	12	5.4	54.1	1889	29.2	1876
Memphis	330	24	29.87	30.23	+ .05	45.5	+ 2.0	73	8	53	5	28	38	27	33	72	3.88	0.0	10	5,488	nw.	29	nw.	28	17	5	9	4.1	60.2	1889	32.4	1876
Nashville	545	25	29.60	30.20	+ .04	41.6	— 0.6	72	8	49	3	28	34	31	34	78	2.81	— 0.7	11	4,808	nw.	30	sw.	10	11	8	12	5.4	56.4	1889	30.2	1876
Lexington	989	12	29.08	30.18		37.4	+ 0.2	65	8	44	— 6	29	30	31	28	69	3.45	+ 0.3	13	9,866	s.	48	s.	10	4	6	21	7.7	50.2	1889	27.9	1872
Louisville	535	24	29.59	30.19	+ .02	39.6	+ 1.1	69	11	47	3	29	32	28	29	71	5.18	+ 1.2	12	6,250	s.	28	n.	26	9	7	15	6.5	51.6	1889	26.5	1876
Indianapolis	766	24	29.30	30.16	+ .02	35.8	+ 2.3	61	11	42	2	28	29	24	28	76	2.09	— 1.2	9	5,621	s.	23	sw.	16	11	6	14	5.7	46.7	1889	22.6	1876
Cincinnati	628	25	29.48	30.18	+ .02	37.5	+ 0.3	65	11	43	0	29	32	24	29	74	3.23	— 0.2	12	6,070	se.	33	s.	10	8	12	11	6.0	48.2	1889	25.2	1876
Columbus	824	17	29.27	30.18	+ .04	34.6	+ 0.4	60	11	41	— 2	29	29	21	27	76	2.95	— 0.2	12	5,378	s.	30	e.	10	6	10	15	6.7	44.6	1889	24.9	1880
Pittsburg	820	25	29.26	30.17	+ .04	36.6	+ 0.8	62	16	43	— 4	29	30	22	31	82	3.10	+ 0.3	15	5,113	w.	26	sw.	12	6	10	15	6.8	45.6	1889	23.1	1876
Parkersburg	638	7	29.49	30.21		36.2	0.0	61	*	44	— 4	29	29	31	31	82	3.55	+ 0.3	14	4,260	s.	30	sw.	12	7	9	15	6.5	47.2	1889	30.7	1892
Lower Lake Region.						33.4	+ 2.2										2.38	— 0.6												
Buffalo	690	25	29.33	30.10	+ .04	33.0	+ 2.5	59	16	38	3	28	28	28	28	80	2.49	— 0.9	15	11,375	nw.	50	w.	12	3	13	15	7.1	37.5	1889	19.4	1876
Oswego	335	25	29.71	30.10	+ .04	30.8	+ 1.4	54	16	36	— 2	29	26	22	25	81	3.14	— 0.3	15	10,112	s.	48	ne.	27	4	8	19	7.3	37.2	1881	20.4	1890
Rochester	523	25	29.51	30.10	+ .04	33.3	+ 3.8	62	16	39	— 1	29	28	24	26	76	3.50	+ 0.7	13	7,312	sw.	36	sw.	12	5	7	19	7.2	36.6	1889	19.5	1876
Erie	714	22	29.31	30.11	+ .04	35.2	+ 1.7	60	15	42	2	29	28	26	26	76	2.53	— 0.8	14	10,424	sw.	51	se.	10	6	6	19	6.7	40.8	1889	22.1	1876
Cleveland	740	25	29.30	30.13	+ .04	34.2	+ 2.7	58	8	39	0	29	29	20	27	77	2.09	— 0.6	13	11,554	sw.	45	w.	12	7	4	20	6.9	42.0	1889	19.8	1876
Sandusky	629	18	29.43	30.14	+ .04	34.4	+ 2.1	60	11	40	0	29	29	20	27	76	2.20	— 0.5	9	7,529	sw.	33	nw.	2	3	5	23	8.4	41.6	1889	24.4	1886
Toledo	674	24	29.37	30.13	+ .04	33.7	+ 2.2	59	8	39	0	28	28	21	26	77	1.92	— 1.0	12	8,659	sw.	39	sw.	16	8	6	17	6.5	41.4	1889	20.6	1872
Detroit	724	25	29.30	30.11	+ .03	32.4	+ 0.9	55	8	37	— 3	28	28	19	26	79	1.56	— 1.1	11	9,471	sw.	42	w.	16	9	5	17	6.0	40.2	1881	18.3	1876
Upper Lake Region.						29.4	+ 1.4										1.72	— 0.5												
Alpena	609	23	29.34	30.03	.00	28.8	+ 3.8	52	21	34	— 6	28	24	20	24	82	1.75	— 0.8	14	7,834	sw.	34	nw.	25	9	8	14	6.4	33.7	1877	15.1	1876
Grand Haven	628	24	29.36	30.07	+ .02	33.2	+ 3.2	52	8	38	— 5	28	29	22	28	82	1.25	— 1.4	13	9,808	sw.	42	w.	16	5	8	18	7.1	41.7	1877	19.9	1872
Marquette	734	24	29.16	29.99	— .02	27.5	+ 4.2	50	14	33	— 2	28	22	31	24	86	2.26	0.0	18	8,084	nw.	40	s.	20	5	7	19	7.5	35.0	1877	12.0	1872
Port Huron	639	21	29.37	30.10	+ .03	31.6	+ 3.3	53	21	37	— 4	28	26	26	24	76	1.28	— 1.1	12	10,100	sw.	45	w.	16	9	7	15	5.9	36.7	1877	17.6	1876
Sault Ste. Marie	642	7	29.27	30.00		25.2	+ 3.3	47	21	30	—19	28	20	23	22	90	3.07	+ 1.0	16	6,778	se.	37	w.	17	3	6	22	8.0	29.8	1891	14.3	1893
Chicago	824	24	29.19	30.11	+ .03	32.4	+ 2.9	55	21	38	— 3	28	27	21	26	78	1.66	— 0.7	9	14,151	sw.	60	sw.	16	9	10	12	5.6	42.8	1877	19.1	1872
Milwaukee	673	25	29.33	30.08	.00	31.3	+ 5.0	56	20	37	— 3	28	26	22	22	71	0.84	— 1.2	6	8,791	w.	35	sw.	16	7	10	14	6.2	37.3	1877	14.0	1876
Green Bay	617	9	29.37	30.07	+ .01	28.8	+ 5.8	51	20	34	— 6	28	23	27	21	73	1.46	— 1.2	6	7,497	sw.	34	w.	16	6	8	17	7.1	31.2	*	13.8	1886
Duluth	656	25	29.27	30.02	— .06	26.2	+ 8.2	52	14	32	—17	27	20	25	21	83	1.87	+ 0.5	9	4,824	w.	29	nw.	27	9	8	14	5.8	34.2	1877	4.9	1872
North Dakota.						19.4	+ 8.2										0.36	— 0.4												
Moorhead	935	14	28.99	30.08	— .07	20.6	+ 9.6	46	19	29	—20	27	12	36	15	81	0.28	— 0.5	5	7,914	s.	38	nw.	21	12	12	7	4.8	20.6	1894	— 0.3	1886
St. Vincent	804	15	29.13	30.06	— .09	16.2	+ 9.8	44	19	26	—24	27	7	41	13	93	0.71	0.0	7	6,274	nw.	36	n.	21	9	8	14	5.8	19.0	1890	— 2.7	1893
Bismarck	1,681	21	28.22	30.12	— .02	22.6	+ 8.4	59	19	33	—23	27	12	42	12	76	0.66	— 0.7	4	5,848	nw.	38	nw.	21	18	5	8	4.5	29.1	1877	— 1.2	1879
Williston	1,875	16	27.98	30.10	— .07	18.0	+ 5.0	47	5	27	—21	27	9	32	10	73	0.40	— 0.3	3	5,101	s.	32	w.	4	15	10	6	4.9	26.0	1890	— 3.3	1879
Upper Miss. Valley.						33.8	+ 4.6										1.71	— 0.8												
Minneapolis						28.2		52	14	35	—14	27	21	31			1.40		8		nw.				9	6	16					
St. Paul	850	24	29.13	30.10	— .01	27.0	+ 7.8	51	14	34	—14	27	20	32	20	76	1.53	+ 0.3	7	6,079	se.	30	nw.	16	15	1	15	5.3	33.6	1877	8.2	1876
La Crosse	720	23	29.29	30.10	.00	30.1	+ 6.1	54	20	37	— 6	26	23	29	22	76	1.03	— 0.3	4	6,294	s.	26	w.	16	12	8	11	5.6	39.2	1877	8.5	1872
Davenport	613	23	29.44	30.12	— .01	32.5	+ 4.2	56	20	39	— 3	28	26	25	24	74	0.61	— 1.2	5	7,514	sw.	41	sw.	16	11	5	15	5.6	42.5	1877	15.4	1876
Des Moines	869	17	29.18	30.16	+ .01	32.6	+ 6.6	65	7	40	— 8	27	25	33	24	75	1.15	— 0.4	6	6,383	sw.	33	w.	8	15	4	12	4.9	39.6	1889	18.4	1884
Dubuque		22				32.3	+ 6.6	56	7	40	— 5	28	25	28			0.35	— 1.6	4		s.				17	0	14		40.0	1877	13.7	1876

TABLE I.—*Climatological data for Weather Bureau Stations, December*, 1894—Continued.

Districts and stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.								Humidity and precipitation.					Wind.				Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Mean temperature data since opening of station.				
			Mean pressure, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean minimum.	Minimum.	Date.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.					Highest for month.	Year.	Lowest for month.	Year.
Up. Miss. Val.—Con.																														
Keokuk	613	24	29.48	30.17	+ .04	34.6	+ 4.8	61	7	41	— 2	28	28	33	25	75	1.06	— 1.0	6	6,588	sw.	36	w.	16	15	7	9	4.3	42.9	1877	18.8	1876
Cairo	359	24	29.79	30.19	+ .04	40.8	+ 1.3	66	1	48	1	28	34	26	32	76	3.87	+ 0.5	11	6,584	s.	33	nw.	26	13	6	12	5.4	54.1	1889	27.3	1876
Springfield, Ill.	644	16	29.44	30.16	+ .01	35.2	+ 1.9	60	21	42	— 2	28	29	25	25	72	3.10	+ 0.3	10	7,986	s.	36	w.	16	7	9	15	6.1	44.4	1889	26.0	1880
Hannibal	534	....	29.57	30.17	.....	35.6	.....	66	7	43	0	28	28	34	26	73	1.34	.....	8	7,792	w.	39	w.	16	11	11	9	5.1	.....	.....	.....	.....
Saint Louis	571	24	29.56	30.20	+ .05	38.8	+ 2.5	63	21	45	1	28	33	23	29	70	2.73	+ 0.3	11	9,189	nw.	36	se.	16	13	7	11	4.9	49.8	1889	24.9	1876
Missouri Valley.						33.0	+ 6.1										0.72	— 0.4													
Columbia	.....	....	.....	.....	.....	37.7	.....	71	7	47	1	28	28	37	.....	.....	1.20	.....	7	5,995	w.	31	s.	15	10	8	13	5.6	.....	.....	.....	.....
Kansas City	963	7	29.14	30.20	+ .02	37.8	+ 4.5	70	7	45	0	28	30	30	27	72	1.16	— 0.3	6	7,533	nw.	33	se.	6	13	10	8	4.3	46.4	1889	27.1	1892
Springfield, Mo.	1,336	9	28.74	30.21	+ .06	38.2	+ 1.2	68	7	46	— 2	28	31	26	28	72	2.28	— 0.2	10	7,981	s.	36	s.	16	10	11	4.9	51.8	1889	31.5	1888
Topeka	.....	8	.....	.....	.....	38.0	+ 3.8	70	7	48	0	28	28	34	.....	.....	0.45	— 0.6	3	.....	s.	....	.....	...	19	5	7	....	45.1	1889	26.4	1892
Omaha	1,123	24	28.93	30.18	— .02	33.2	+ 6.2	61	20	41	— 8	27	25	33	22	69	0.94	— 0.1	7	5,734	nw.	26	s.	20	15	4	12	4.3	39.4	1889	17.3	*
Valentine	2,613	10	27.32	30.17	+ .04	30.4	+ 5.2	66	19	44	—20	27	16	46	15	63	0.05	— 0.6	2	6,934	w.	48	w.	7	16	12	3	4.1	35.6	1889	19.2	1886
Sioux City	1,165	....	28.84	30.14	.....	30.2	.....	56	20	38	—12	27	22	32	21	77	1.30	.....	7	7,570	nw.	48	nw.	8	12	9	10	4.9	.....	.....	.....	.....
Pierre ‖	1,470	20	28.49	30.13	— .04	26.6	6.1	67	20	38	—15	27	16	42	17	73	0.08	— 0.4	1	5,229	nw.	48	w.	20	16	10	5	3.5	30.9	1881	9.3	1886
Huron	1,310	14	28.65	30.13	— .06	26.7	+ 8.5	65	20	39	—18	27	14	44	17	77	0.10	— 0.7	2	9,687	nw.	58	sw.	20	16	8	7	4.1	27.9	1881	8.6	1884
Northern Slope.						25.8	+ 1.2										0.30	— 0.2													
Havre	2,477	15	27.33	30.08	— .07	23.4	+ 5.7	55	6	33	— 9	28	14	36	15	78	0.47	— 0.2	4	6,476	w.	38	sw.	13	13	8	10	5.0	33.0	1885	3.5	1884
Miles City	2,374	18	27.52	30.15	.....	23.6	+ 4.3	53	6	35	—20	27	12	38	14	73	0.23	— 0.1	3	3,599	sw.	36	nw.	7	20	9	2	2.6	29.6	1885	3.8	1879
Helena	4,108	15	25.84	30.22	+ .05	24.2	+ 0.5	51	19	32	—12	30	16	27	13	65	0.63	— 0.4	6	3,916	sw.	36	sw.	7	13	9	9	5.1	31.2	1893	7.0	1884
Rapid City	3,280	9	26.62	30.13	— .05	31.2	— 0.2	72	20	44	—16	27	19	37	14	56	0.05	— 0.2	4	6,197	w.	56	sw.	20	17	11	3	3.6	35.2	1889	22.4	1892
Cheyenne	6,105	24	23.99	30.29	+ .12	27.6	— 1.9	58	22	38	—13	27	18	41	10	54	0.70	+ 0.5	8	8,152	nw.	72	w.	20	16	13	2	3.1	36.5	1889	18.8	1884
Lander ‡	5,377	11	24.65	30.31	.....	20.3	— 2.4	51	6	34	—17	28	7	37	6	65	0.03	— 0.6	2	2,545	sw.	60	sw.	20	18	13	9	3.3	30.5	1889	15.8	1892
North Platte	2,841	21	27.15	30.25	+ .05	30.4	+ 2.7	67	14	46	—10	27	15	55	14	64	T.	— 0.7	0	5,938	w.	42	w.	7	15	15	1	3.3	37.2	1889	15.0	1879
Middle Slope.						34.1	+ 0.4										0.67	0.0													
Denver	5,287	24	24.77	30.26	+ .08	31.7	— 0.3	69	20	43	— 8	28	20	41	15	59	0.69	0.0	6	5,142	s.	40	sw.	20	18	10	3	3.5	40.5	1889	22.6	1878
Pueblo	4,734	7	25.30	30.24	.....	31.4	— 3.3	69	18	45	—13	28	18	50	11	48	0.68	+ 0.2	4	5,016	nw.	40	nw.	7	17	11	3	3.9	42.8	1889	27.1	1892
Concordia	1,410	10	28.04	30.20	+ .05	35.4	+ 2.9	70	6	46	4	27	25	39	21	66	0.62	— 0.1	4	6,089	s.	34	s.	6	20	6	5	3.0	42.0	1889	24.2	1886
Dodge City	2,523	21	27.49	30.23	+ .05	34.4	+ 1.3	79	20	46	—11	28	23	40	19	65	0.62	0.0	5	8,054	nw.	41	sw.	20	19	9	3	3.7	44.6	1889	21.0	1884
Wichita	1,366	7	28.70	30.21	.....	37.8	+ 3.2	74	7	48	—10	28	28	37	24	66	0.75	— 0.2	6	7,291	s.	33	s.	14	22	4	5	3.6	46.4	1889	27.6	1892
Oklahoma	1,239	....	28.88	30.24	.....	41.6	.....	73	7	51	— 1	28	32	32	30	70	1.51	.....	4	7,283	s.	36	n.	27	23	3	5	3.1	.....	.....	.....	.....
Southern Slope.						.....	.....										.....	.....													
Abilene	1,749	10	28.36	30.24	+ .06	47.6	+ 0.9	78	21	57	6	28	38	36	32	63	0.43	— 0.8	4	7,336	s.	42	w.	10	10	11	10	4.9	59.6	1889	40.3	1887
Amarillo	3,691	....	26.35	30.23	.....	39.0	.....	75	20	50	0	28	28	39	22	60	0.82	.....	5	12,896	s.	58	sw.	15	9	14	8	5.2	.....	.....	.....	.....
Southern Plateau.						47.7	+ 0.9										1.05	+ 0.3													
El Paso	3,813	17	26.29	30.22	+ .03	48.2	+ 3.1	73	1	58	23	26	38	37	28	51	0.63	0.0	4	8,398	nw.	54	nw.	10	5	12	14	6.3	53.2	1889	40.2	1887
Santa Fe	7,051	22	23.30	30.21	+ .06	33.7	+ 1.0	55	19	42	7	28	26	26	16	54	1.28	+ 0.5	10	4,264	ne.	26	ne.	9	14	10	7	4.9	39.8	1889	25.6	1891
Tucson	2,390	12	27.59	30.09	.....	54.0	+ 2.0	78	19	64	30	11	44	37	40	69	1.88	+ 0.8	9	2,927	nw.	20	s.	13	6	10	15	6.8	54.0	1894	44.4	1891
Yuma	141	19	29.92	30.07	+ .01	54.8	— 2.5	72	3	65	37	*	45	34	39	63	0.40	— 0.2	6	3,943	n.	32	nw.	25	12	8	11	5.1	60.2	1890	51.3	1891
Independence	3,950	....	26.03	30.13	.....	38.4	.....	57	1	46	22	4	31	27	26	62	1.89	.....	9	5,608	nw.	52	w.	9	8	15	8	5.4	.....	.....	.....	.....
Middle Plateau.						29.3	— 4.6										2.26	+ 0.4													
Carson City	4,720	8	25.26	30.16	.....	31.1	— 3.8	51	18	40	6	29	22	30	18	57	3.56	+ 1.0	15	.....	sw.	....	.....	...	17	4	10	5.1	39.0	1893	31.1	1894
Winnemucca	4,340	16	25.66	30.22	+ .01	25.3	— 0.5	48	4	35	—11	25	16	32	17	73	1.93	+ 0.7	16	8,171	e.	56	sw.	20	8	7	16	6.6	37.1	1886	25.3	1894
Salt Lake City	4,345	21	25.71	30.27	+ .03	31.4	— 3.1	56	22	39	9	27	24	24	22	71	1.28	— 0.4	9	4,132	se.	46	s.	20	9	8	14	6.2	39.6	1889	26.9	1576
Northern Plateau.						33.1	— 2.0										1.22	— 1.4													
Baker City	3,430	6	26.46	30.12	.....	26.8	.....	45	18	34	— 1	28	20	24	18	71	1.39	.....	12	4,351	se.	30	se.	21	6	12	13	6.2	32.7	1893	24.4	1891
Idaho Falls	4,742	5	25.29	30.32	.....	18.9	.....	45	22	30	—15	28	8	35	14	82	1.10	.....	14	5,003	nw.	40	sw.	20	12	7	12	5.5	28.3	1893	18.9	1894
Spokane	1,930	13	28.02	30.14	+ .02	31.4	+ 0.6	44	5	36	4	28	27	20	26	81	1.65	— 1.1	13	4,250	ne.	30	sw.	8	5	6	20	7.4	38.2	1890	15.5	1884
Walla Walla	1,018	9	29.00	30.13	+ .04	34.8	— 4.5	59	21	40	14	29	29	31	28	81	0.80	— 1.7	11	4,836	s.	37	e.	8	4	13	14	6.6	43.2	1890	32.0	1889
N. Pac. Coast Region.						30.9	— 2.8										6.27	— 3.1													
East Clallam	.....	....	.....	.....	.....	38.0	.....	48	13	42	28	31	34	13	.....	.....	8.03	.....	18	.....	e.	....	.....	...	12	1	18	....	.....	.....	.....	.....
Fort Canby	179	12	29.70	29.90	— .06	41.2	— 3.0	50	5	45	32	7	37	13	35	78	5.35	— 5.5	17	14,00	e.	77	se.	11	9	4	18	6.5	47.5	1886	36.5	1884
Neah Bay	.....	10	.....	.....	.....	41.4	— 1.8	55	23	47	32	6	36	19	.....	.....	11.98	— 2.5	16	.....	e.	....	.....	...	10	4	17	....	47.7	1886	34.4	1884
Olympia †	.....	18	.....	.....	.....	38.0	— 3.0	50	*	44	19	28	32	23	.....	.....	4.76	— 5.0	15	.....	s.	....	.....	...	5	11	15	....	44.6	1886	32.7	1884
Port Angeles	29	11	29.91	29.94	.00	38.0	— 0.2	49	11	43	26	30	33	15	33	85	1.63	— 3.7	12	3,807	s.	48	ne.	9	6	11	14	6.5	41.5	1893	30.4	1884
Port Crescent	.....	.....	.....	.....	.....	36.5	.....	47	16	41	25	7	32	15	.....	.....	3.16	.....	14	.....	e.	....	.....	...	9	11	11	....	.....	.....	.....	.....
Pysht	.....	.....	.....	.....	.....	37.4	.....	49	13	42	26	*	33	16	.....	.....	5.55	.....	20	.....	e.	....	.....	...	1	3	26	....	.....	.....	.....	.....
Seattle	119	....	29.82	29.96	.....	39.4	.....	50	11	44	28	28	34	20	32	78	3.75	.....	15	4,468	s.	36	s.	9	10	3	18	6.2	.....	.....	.....	.....
Tatoosh Island	86	12	29.81	29.91	— .02	41.2	— 2.5	49	5	45	33	7	38	14	36	81	11.75	— 2.9	16	15,402	e.	76	e.	7	10	4	17	6.5	47.8	1888	36.0	1884
Astoria	.....	10	.....	.....	.....	40.8	— 3.7	52	5	45	31	28	36	12	.....	.....	6.67	— 4.3	19	.....	e.	....	.....	...	9	3	19	....	47.5	1886	40.7	1889
Portland	157	24	29.83	30.01	— .07	39.5	— 2.5	56	5	44	27	29	35	17	33	79	3.47	— 4.8	16	8,030	se.	54	sw.	7	8	11	12	5.7	47.8	1875	31.0	1884
Roseburg	523	18	29.39	29.98	— .14	37.2	— 6.1	56	5	41	20	28	33	16	35	93	7.26	+ 0.8	20	2,059	sw.	28	sw.	5	3	12	16	7.0	47.0	1886	37.2	1894
Mid. Pac. Coast Reg.						38.9	— 2.3										10.30	+ 4.6													
Eureka	64	8	29.92	29.98	— .09	46.0	— 2.5	60	3	32	30	24	40	24	42	87	12.31	+ 4.2	25	5,174	se.	36	se.	7	5	8	18	6.8	52.2	1888	45.4	1891
Red Bluff	342	18	29.69	30.07	— .07	45.0	— 2.5	62	13	30	32	26	40	24	40	87	11.01	+ 5.7	22	6,534	nw.	46	se.	9	5	5	21	7.4	50.2	1893	42.6	1891
Sacramento	71	18	29.99	30.07	— .06	46.9	— 1.6	58	30	32	30	26	42	18	42	86	8.86	+ 4.6	20	8,219	n.	60	se.	9	3	9	19	7.5	49.2	1886	43.2	1890
San Francisco	153	24	29.89	30.05	— .07	49.7	— 2.6	61	13	53	40	27	46	15	44	82	9.01	+ 3.8	22	6,704	se.	40	s.	7	3	9	19	7.4	53.5	1885	49.4	1879
Point Reyes Light	.....	.....	.....	.....	.....	48.4	.....	60	13	55	34	27	42	17	.....	.....	9.50	.....	21	.....	se.	....	.....	...	4	0	27	....	.....	.....	.....	.....
S. Pac. Coast Region.						52.1	0.9										3.86	+ 0.9													
Fresno	338	8	29.71	30.08	— .04	47.6	+ 0.9	63	18	55	31	*	40	30	42	84	4.09	+ 2.6	13	3,696	se.	22	nw.	6	4	9	18	7.1	49.1	1889	43.8	1890
Los Angeles †	330	18	29.72	30.08	.00	53.8	— 2.1	75	3	62	39	24	46	31	44	77	4.62	+ 0.2	10	2,655	e.	23	w.	19	9	8	14	6.0	61.2	1890	52.8	*
San Diego	93	24	29.98	30.08	.00	54.8	— 1.5	70	25	62	41	21	48	24	46	78	2.26	— 0.1	14	3,197	ne.	27	s.	19	10	4	17	5.8	60.8	1890	52.2	1891
San Luis Obispo	234	....	29.83	30.08	.....	51.7	.....	66	*	50	34	3	44	32	43	77	8.96	.....	16	4,501	s.	30	se.	22	7	10	14	6.5	.....	.....	.....	.....

NOTE.—The data at stations having no departures are not used in computing the district averages. Letters of the alphabet denote number of days missing from the record. *Two or more directions, dates, or years. † Received too late to be considered in departures, etc. ‡ Normals of temperature and precipitation and extremes of temperature combined with Fort Washakie records. § All temperature and precipitation normals and extremes of temperature are obtained from Fort Buford records. ‖ Normals of temperature and precipitation and extremes of temperature combined with Fort Sully records.

TABLE I *a.*—*Temperature of the wet-bulb thermometer, December*, 1894.

Number.	Station.	8 A. M.			8 P. M.		
		Max.	Min.	Mean.	Max.	Min.	Mean.
	New England.	°	°	°	°	°	°
1	Eastport, Me	46	— 2	23	46	3	27
2	Portland, Me	41	7	22	42	9	26
3	Northfield, Vt	39	—10	17	40	—15	20
4	Boston, Mass	47	8	28	46	8	29
5	Nantucket, Mass	50	—15	34	52	12	34
6	Woods Holl, Mass				54	12	33
7	Block Island, R. I	49	10	33	52	14	34
8	New Haven, Conn	45	5	27	48	8	30
9	New London, Conn	46	8	29	50	13	32
	Middle Atlantic States.						
10	Albany, N. Y	43	— 4	25	44	— 2	28
11	New York, N. Y	45	8	31	47	11	33
12	Harrisburg, Pa	43	4	29	44	9	33
13	Philadelphia, Pa	46	7	32	46	12	34
14	Atlantic City, N. J	49	8	34	50	14	36
15	Baltimore, Md	46	6	31	46	11	34
16	Washington, D. C	45	5	30	47	12	34
17	Lynchburg, Va	50	6	33	51	13	36
18	Norfolk, Va	58	12	38	62	17	41
	South Atlantic States.						
19	Charlotte, N. C	61	3	36	58	11	41
20	Hatteras, N. C	66	17	46	65	24	48
21	Kittyhawk, N. C	61	14	43	63	19	45
22	Raleigh, N. C	62	9	36	60	18	41
23	Wilmington, N. C	65	12	40	65	18	45
24	Charleston, S. C	66	11	45	63	20	49
25	Augusta, Ga	64	10	40	66	13	46
26	Savannah, Ga	67	10	45	67	17	50
27	Jacksonville, Fla	66	13	49	68	20	53
	Florida Peninsula.						
28	Jupiter, Fla	71	22	60	73	34	62
29	Key West, Fla	73	41	64	74	43	65
30	Tampa, Fla	72	18	54	72	29	59
31	Titusville, Fla	67	17	55	72	28	58
	Eastern Gulf States.						
32	Atlanta, Ga	63	4	39	60	6	43
33	Pensacola, Fla	70	13	49	70	21	53
34	Mobile, Ala	68	14	47	67	22	52
35	Montgomery, Ala	67	11	43	65	15	49
36	Meridian, Miss	64	10	40	65	16	47
37	Vicksburg, Miss	64	14	44	65	18	47
38	New Orleans, La	68	20	50	68	24	54
	Western Gulf States.						
39	Shreveport, La	64	10	43	65	24	48
40	Fort Smith, Ark	59	6	36	62	14	43
41	Little Rock, Ark	62	7	38	62	18	42
42	Corpus Christi, Tex	70	23	55	72	32	62
43	Galveston, Tex	68	20	53	68	24	56
44	Palestine, Tex	64	8	43	67	21	49
45	San Antonio, Tex	66	15	44	62	24	50
	Ohio Valley and Tennessee.						
46	Chattanooga, Tenn	61	5	37	59	6	41
47	Knoxville, Tenn	54	2	35	56	6	40
48	Memphis, Tenn	62	6	38	61	18	42
49	Nashville, Tenn	58	3	35	59	7	40
50	Lexington, Ky	54	— 2	32	55	0	36
51	Louisville, Ky	57	5	33	57	4	36
52	Indianapolis, Ind	52	3	31	48	5	33
53	Cincinnati, Ohio	56	2	32	55	5	35
54	Columbus, Ohio	52	2	30	52	4	33
55	Pittsburg, Pa	53	— 3	32	53	5	35
56	Parkersburg, W. Va	55	— 2	31	56	8	36
	Lower Lake Region.						
57	Buffalo, N. Y	48	4	30	49	8	32
58	Oswego, N. Y	41	— 1	27	50	9	30
59	Rochester, N. Y	46	0	29	48	4	30
60	Erie, Pa	47	2	30	51	10	31
61	Cleveland, Ohio	52	2	30	47	8	31
62	Sandusky, Ohio	50	4	30	51	12	32
63	Toledo, Ohio	51	0	29	52	8	32
64	Detroit, Mich	48	— 3	28	48	5	31
	Upper Lake Region.						
65	Alpena, Mich	41	— 6	25	40	1	28
66	Grand Haven, Mich	51	7	30	46	7	32
67	Marquette, Mich	42	— 2	25	41	4	27
68	Port Huron, Mich	45	— 4	27	45	3	30
69	Sault Ste. Marie, Mich	39	—18	23	37	—12	25
70	Chicago, Ill	47	— 2	29	50	8	31
71	Milwaukee, Wis	46	— 3	26	44	5	29
72	Green Bay, Wis	42	— 6	23	42	1	28
73	Duluth, Minn	39	—16	22	40	— 5	25
	North Dakota.						
74	Moorhead, Minn	35	—18	16	39	—14	21
75	St. Vincent, Minn	34	—19	12	36	—18	16
76	Bismarck, N. Dak	33	—23	14	41	—12	20
77	Williston, N. Dak	27	—21	12	33	—13	17
	Upper Mississippi Valley.						
78	St. Paul, Minn	41	—12	23	42	— 6	26
79	La Crosse, Wis	42	— 3	24	49	— 4	29
80	Davenport, Iowa	46	— 2	26	51	2	30
81	Des Moines, Iowa	49	— 5	26	47	1	32
82	Keokuk, Iowa	49	0	28	52	3	32
83	Cairo, Ill	60	1	34	58	12	38
84	Springfield, Ill	46	— 2	29	52	7	32
85	Hannibal, Mo	49	1	29	55	3	33
86	St. Louis, Mo	52	0	33	55	8	36
	Missouri Valley.						
87	Columbia, Mo				54	3	33
88	Kansas City, Mo	55	2	29	52	4	36
89	Springfield, Mo	55	— 2	31	56	6	35
90	Omaha, Nebr	42	— 6	24	50	1	32
91	Valentine, Nebr	35	—19	17	42	— 3	27
92	Sioux City, Iowa	36	—11	22	47	0	29
93	Pierre, S. Dak	38	—13	18	46	— 2	26
94	Huron, S. Dak	43	—17	18	48	— 4	24
	Northern Slope.						
95	Havre, Mont	35	— 7	17	38	— 1	22
96	Miles City, Mont	30	—18	15	39	— 6	24
97	Helena, Mont	37	— 8	17	40	— 2	23
98	Rapid City, S. Dak	40	—14	21	43	— 5	24
99	Cheyenne, Wyo	36	—10	20	34	— 6	21
100	Lander, Wyo	41	—16	9	33	— 3	18
101	North Platte, Nebr	35	—10	16	41	4	27
	Middle Slope.						
102	Denver, Colo	45	— 2	22	40	— 1	28
103	Pueblo, Colo	36	—12	18	44	— 1	28
104	Concordia, Kans	44	— 5	25	50	1	31
105	Dodge City, Kans	44	—11	23	53	— 5	30
106	Wichita, Kans	46	— 9	27	55	2	35
107	Oklahoma, Okla	56	— 2	32	56	3	39
	Southern Slope.						
108	Abilene, Tex	60	7	37	61	16	42
109	Amarillo, Tex	48	1	28	49	5	34
	Southern Plateau.						
110	El Paso, Tex	48	19	36	54	25	42
111	Santa Fe, N. Mex	42	8	25	41	9	28
112	Tucson, Ariz	57	31	43	60	38	50
113	Yuma, Ariz	50	37	43	58	40	50
114	Independence, Cal	40	22	31	46	30	36
	Middle Plateau.						
115	Carson City, Nev	35	10	24	39	20	30
116	Winnemucca, Nev	35	— 9	18	37	8	26
117	Salt Lake City, Utah	42	9	25	42	18	30
	Northern Plateau.						
118	Baker City, Oreg	36	— 1	21	38	9	25
119	Idaho Falls, Idaho	34	— 8	12	40	— 2	21
120	Spokane, Wash	34	8	27	39	18	31
121	Walla Walla, Wash	44	14	30	44	21	33
	North Pacific Coast Region.						
122	Fort Canby, Wash	48	30	38	45	32	39
123	Port Angeles, Wash	40	25	34	42	30	36
124	Seattle, Wash	42	26	35	42	30	38
125	Tatoosh Island, Wash	48	34	39	46	36	40
126	Portland, Oreg	45	26	36	42	24	37
127	Roseburg, Oreg	44	21	35	44	27	38
	Middle Pacific Coast Region.						
128	Eureka, Cal	52	32	42	52	40	46
129	Red Bluff, Cal	46	31	41	50	36	44
130	Sacramento, Cal	50	34	43	52	39	46
131	San Francisco, Cal	51	37	46	54	41	47
	South Pacific Coast Region.						
132	Fresno, Cal	50	32	42	52	41	48
133	Los Angeles, Cal	54	40	46	56	45	51
134	San Diego, Cal	56	40	48	58	45	52
135	San Luis Obispo, Cal	54	35	45	55	43	49

TABLE II.—*Meteorological record of voluntary and other co-operating observers, December, 1894.*

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean.	Precip'n.
Alabama.	°	°	°	*Ins.*
Alco	78	12	53.6	.....
Ashville *[1]	73[j]	6	43.0[d]	.....
Bermuda †	77	11	53.0	5.48
Brewton †	79	10	53.2	0.75
Carrollton *† [1]	72	12	48.2	6.15
Citronelle †	74	17	54.4	5.68
Claiborne Landing †	.....	.....	.....	3.61
Collirene *[1]	76	10	50.2	2.95
Cordova †	.....	.....	.....	5.63
Daphne †	81	8	52.6	3.24
Decatur b †	73	3	44.4	4.01
Demopolis †	.....	.....	.....	5.13
Eufaula a †	75	10	52.3	3.78
Eufaula c †	.....	.....	.....	3.89
Evergreen †	75	11	51.8	3.61
Florence a †	.....	.....	.....	3.42
Florence b †	72	7	44.4	3.42
Fort Deposit †	74	12	51.7	5.87
Gadsden †	73	8	47.4	6.26
Greensboro †	74	11	47.8	5.38
Healing Springs †	79	8	48.6	7.17
Highland Home †	74	10	52.0	5.55
Jasper † [e]	79	3	43.2	7.17
Livingston †	77[h]	8[h]	48.6[h]	5.61
Lock No. 4	.....	.....	.....	2.06[i]
Madison Station †	74	5	47.2	5.04
Maple Grove †	71	6	46.1	7.39
Marion †	74	0	48.8	3.92
Mount Willing †	77	9	51.2	4.71
Newbern †	75	10	49.8	4.18
Newburg †	79	3	45.6	4.50
Opelika †	69	11	46.2	2.10
Oxanna *† [1]	68	7	45.7	7.69
Pine Apple †	74	7	47.4	3.51
Pushmataha †	77	10	49.4	4.65
Scottsboro	71	4	46.2	6.43
Rock Mills † [e]	71	7	46.2	4.57
Selma †	.....	.....	.....	5.04
Sturdevant †	.....	.....	.....	2.78
Tallassee Falls †	.....	.....	.....	6.00
Tuscaloosa †	75	9	46.0	5.97
Union †	78	13	50.0	5.00
Union Springs †	75	9	50.0	4.75
Uniontown †	74[d]	11[d]	49.8[d]	4.20
Valley Head †	68	1	44.4	5.35
Warrior †	.....	.....	.....	5.39
Wetumpka	.....	.....	.....	4.45
Wilsonville †	.....	.....	.....	4.68
Alaska.				
Juneau †	41	7	27.6	7.22
Killisnoo †	40	9	28.8	4.05
Arizona.				
Benson a *[s]	75	30	51.5	0.74
Bisbee *† [1]	66	31	48.3	1.31
Buckeye †	85	26	54.8	1.50
Calabasas †	74	25	50.2	1.79
Casa Grande *[s]	69	40	54.9	2.53
Dragoon †	.....	.....	.....	2.54
Dragoon Summit *[s]	64	32	48.5	1.70
Dudleyville †	75	28	49.6	3.50
Eagle Pass *[s]	.....	25	41.8	2.99
Farleys Camp †	80	30	53.2	3.15
Flagstaff †	62	6	31.4	5.99
Fort Apache	65	18	41.6	2.81
Fort Grant †	74°	32°	48.0°	2.79
Fort Huachuca	72	28	47.0	2.26
Gila Bend *[s]	75	39	56.5	1.55
Globe †	64	30	46.0	4.23
Holbrook †	65	12	39.8	0.43
Keams Canyon †	57	11	36.0	1.78
Lochiel *† [1]	71	27	49.3	1.89
Maricopa *[s]	85	37	56.9	2.44
Mount Huachuca †	68	26	48.4	5.28
Natural Bridge †	.....	.....	.....	4.61
Navajo *† [s]	.....	27	46.2	.....
Nogales	78	29	52.4	4.68
Oracle †	68	29	49.4	3.52
Oro	.....	.....	.....	1.16
Pantano *[s]	80	34	55.7	1.13
Parker †	76	28	52.6	1.21
Payson	.....	.....	.....	4.21
Peoria †	68	36	53.0	1.61
Phœnix b †	70	32	53.2	1.43
Red Rock	70	33	51.5	2.25
Reymert †	75	30	52.0	4.56
Rye †	70	23	46.4	3.35
San Carlos	73	21	46.3	2.58
San Simon *[s]	80	30	50.2	0.00
Show Low	.....	.....	.....	3.63
Signal †	68	31	51.0	2.22
Sulphur Spr'g Val †	.....	.....	.....	0.87
Texas Hill *[s]	80	33	56.2	0.00
Tucson b *[s]	80	45	58.5	0.80
Tucson c †	79	30	54.9	1.70
Walnut Ranch *† [1]	69	26	47.2	1.68
Whipple Barracks †	63	17	39.1	3.43
Wilgus †	.....	.....	.....	0.78
Willcox *[s]	67	30	46.8	0.67
Yuma *[s]	75	35	52.0	0.29
Arkansas.				
Arkadelphia †	.....	.....	.....	3.70
Arkansas City †	.....	.....	.....	3.37
Bee Branch †	82	5	47.2	3.80
Arkansas—Cont'd.				
Blanchard Springs †	75	6	46.6	4.43
Brinkley †	73	8	47.1	3.55
Camden a †	.....	.....	.....	3.43
Camden b †	74	8	46.0	3.04
Conway *[1]	69	11	43.1	3.69
Corning †	70	— 9	37.8	3.33
Dallas †	75	3	45.3	2.82
Dardanelle †	.....	.....	.....	3.30
Fayetteville †	70	— 6	42.8	2.18
Forrest †	73	7	45.6	3.35
Fulton †	.....	.....	.....	2.27
Helena a †	.....	.....	.....	4.63
Helena b †	72	8	45.7	7.15
Hot Springs a	72	0	44.3	3.20
Hot Springs b	.....	.....	.....	4.12
Hot Springs (near)	.....	.....	.....	4.12
Keesees Ferry †	75	— 3	41.4	2.40
Lonoke *[1]	71	11	47.2	3.75
Luna Landing *[s]	77	12	49.5	3.50
Mount Nebo †	64	0	41.2	3.97
New Gascony *[1]	70[a]	10[a]	44.9[a]	3.58
Newport a †	.....	.....	.....	5.53
Newport b †	70	5	46.0	5.22
Newport c †	71	5	43.6	5.43
Osceola †	72	4	43.4	2.38
Ozark †	73	6	46.7	2.82
Pocahontas †	70	—11	38.3	2.29
Rison †	72	10	45.4	3.73
Rogers †	69	— 6	38.8	1.45
Searcy †	.....	.....	.....	3.72
Stuttgart †	72	9	45.2	3.73
Texarkana †	73	9	48.2	2.18
Washington †	71	9	46.6	3.10
Winslow †	66	— 3	40.6	4.60
California.				
Adin	49	— 2	29.2	3.72
Ager	48	14	33.5	3.16
Anaheim *[s]	71	41	53.1	5.69
Anderson *[1]	57	27	41.1	13.33
Antioch *[s]	58	37	48.6	8.11
Aptos *[s]	60	30	46.9	13.32
Arlington Heights	74	33	50.4	4.25
Athlone *[s]	60	30	46.1	5.62
Auburn *[s]	72	33	51.3	13.56
Bakersfield a *[s]	67	30	51.0	1.43
Bakersfield b *[1]	70	34	52.6	1.26
Ballast Point L. H.	.....	.....	.....	3.45
Barstow †	62	22	44.8	0.92
Bear Valley †	.....	.....	.....	22.37
Beaumont *[s]	66	34	46.3	8.89
Belmont *[s]	70	43	56.9	.....
Berendo *[s]	65	35	49.7	4.94
Berkeley	57	37	48.0	12.63
Bethany *[1]	58	35	47.2	7.93
Bishop Creek *[s]	59	16	37.1	2.00
Boca *[s]	75	0	29.5	11.80
Borden *[s]	67	33	48.7	4.82
Boulder Creek *[s]	76	28	54.0	30.53
Brentwood *[s]	58	34	46.3	7.86
Brighton *[s]	58	31	48.1	7.98
Byron *[s]	56	30	45.3	7.94
Caliente *[s]	62	36	50.1	4.39
Calistoga *[s]	68	32	49.1	15.39
C. Mendocino L. H.	.....	.....	.....	17.80
Capitola *[s]	64	36	51.3	.....
Castroville *[s]	65	32	51.9	7.04
Cedarville †	46	— 4	26.9	2.19
Centerville *[1]	64	39	52.3	9.45
Chicago Park *[1]	58	28	40.3	17.20
Chico *[s]	66	31	48.6	11.68
Chino *† [s]	68	32	49.9	8.22
Cisco *[s]	42	18	32.0	21.60
Claremont †	67	33	49.8	7.73
Cloverdale *[1]	62	34	49.6	18.60
Colfax *[s]	65	30	41.5	24.17
Colton *[s]	78	30	52.6	5.70
Corning *[s]	62	34	50.8	10.85
Crescent City †	59	32	45.8	13.46
Crescent City L. H.	.....	.....	.....	14.30
Crofton *[s]	70	38	50.4	6.43
Davisville a *[s]	70	35	46.1	7.59
Davisville b	81	31	52.0	9.81
Deep Creek	.....	.....	.....	18.41
Delano *[s]	67	30	48.5	1.75
Delta *[s]	55	30	40.8	33.17
Dinuba *[s]	68	42	51.2	3.17
Downey *[s]	88	38	57.8	4.10
Drytown	58	30	45.8	12.47
Dunnigan *[s]	66	30	48.2	11.22
Dunsmuir *[s]	48	20	38.7	15.80
Durham *[1]	58	31	46.6	10.12
East Brother L. H.	.....	.....	.....	7.70
Edgwood *[s]	43	10	32.2	9.55
Edmanton *[1]	44	9	30.0	24.00
Eldorado *[s]	63	33	46.5	14.37
Elk Grove *[s]	57	35	44.5	.....
Elmira *[s]	73	33	49.3	12.83
El Verano *[s]	64	29	48.8	14.09
Emigrant Gap *[s]	43	20	32.2	.....
Escondido	71	27	51.6	.....
Evergreen	.....	.....	.....	7.00
Exeter *[s]	72	36	51.1	3.21
Fall Brook *[1]	72	35	50.2	6.09

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
California—Cont'd.	°	°	°	*Ins.*
Farmington *[s]	68	32	47.3	7.74
Felton *[s]	68	28	52.0	24.14
Fernando *[s]	66	35	50.7	5.82
Florence *[s]	80	42	55.8	4.36
Florin *[1]	60	30	47.3	8.02
Folsom City a *[s]	58	28	47.5	11.68
Folsom City b *[1]	62	29	47.9	11.74
Fordyce Dam †	.....	.....	.....	38.41
Fort Ross	.....	.....	.....	20.81
Fremontville *[1]	71	32	51.6	4.27
Fresno *[s]	70	33	49.2	3.67
Fruto *[s]	78	35	50.9	9.75
Galt *[s]	61	34	48.7	9.29
Georgetown †	64	29	40.8	20.93
Gilroy *[s]	65	30	49.4	8.44
Girard *[s]	55	30	42.8	3.12
Glendora	.....	.....	.....	9.87
Glen Ellen *[s]	62	31	48.2	19.91
Gormans Station †	.....	.....	.....	5.36
Goshen *[s]	66	29	49.3	2.91
Grass Valley a	.....	.....	.....	16.55
Green Valley	.....	.....	.....	21.64
Greenville *† [1]	49	— 6	27.4	13.39
Haywards *[s]	58	38	48.9	10.40
Healdsburg *[1]	62	30	43.6	16.32
Hendersons Ranch	.....	.....	.....	7.10
Hollister *[s]	60	35	52.1	5.06
Hornbrook *[s]	50	20	35.1	2.30
Hueneme	.....	.....	.....	3.43
Humboldt L. H.	.....	.....	.....	13.80
Huron *[s]	70	38	51.9	2.41
Hydesville †	60	25	44.4	11.20
Indio a *[s]	79	40	55.3	.....
Ione *[s]	68	29	51.4	8.64
Iowa Hill *[1]	64	32	42.2	17.57
Jackson	51	30	38.8	15.50
Jolon	.....	.....	.....	8.30
Julian †	68	25	44.6	9.38
Keeler *[s]	78	32	44.4	1.05
Keene *[s]	62	33	45.5	4.59
Kennedy Gold Mine	58	30	44.3	16.44
Kernville	.....	.....	.....	5.31
King City *[s]	74	30	50.3	4.15
Kingsburg *[s]	62	32	48.2	3.46
Knights Landing *[s]	64	30	45.3	12.52
Kono Tayee	57	31	44.4	10.70
Lagrange *[s]	60	34	48.9	7.60
Laguna Mountains	.....	.....	.....	8.45
La Porte *† [1]	50	12	30.6	15.47
Lathrop *[s]	70	30	48.9	5.21
Laurel *[s]	62	35	47.3	24.91
Lemoore a *[s]	62	30	47.5	2.77
Lick Observatory †	50	28	37.2	11.90
Lime Point L. H.	.....	.....	.....	8.61
Little Bear Valley	.....	.....	.....	20.12
L. Bear Val. (near)	.....	.....	.....	24.59
Livermore *[s]	67	35	49.4	8.56
Livingston *[s]	65	35	49.4	5.24
Lodi	60	31	47.1	9.27
Long Beach *[s]	70	35	55.3	.....
Los Alamos	.....	.....	.....	4.00
Los Angeles *[s]	72	40	54.5	4.78
Los Banos *[s]	59	30	46.2	4.08
Los Gatos a *[s]	63	30	48.9	15.85
Los Gatos b	58	33	46.0	17.77
L. Holcomb Valley	.....	.....	.....	15.69
Mammoth Tank *[s]	68	37	51.1	1.22
Manzana	58	27	40.6	3.60
Mare Island L. H	.....	.....	.....	9.61
Mariposa *[1]	63	30	43.2	13.36
Martinez *[s]	60	32	45.9	12.02
Marysville *[s]	63	29	50.6	9.13
Mendota *[s]	63	32	49.3	3.65
Menlo Park *[s]	60	33	49.0	9.65
Merced *[s]	58	30	46.9	4.74
Middletown *† [1]	64	26	43.0	20.52
Mills College	.....	.....	.....	12.90
Milton *[s]	56	32	45.6	8.72
Milton (near) *[1]	56	32	48.2	10.53
Modesto *[s]	67	34	48.1	5.42
Mohave *[s]	60	30	44.7	3.68
Mokelumne Hill *[s]	.....	36	44.5	14.31
Montague *[s]	52	15	34.6	1.75
Monterey *[s]	64	34	51.9	5.87
Monterey (Hotel del Monte) *[s]	66	40	53.7	.....
Morses House	.....	.....	.....	26.77
Mountain View	.....	.....	.....	8.35
Mount Glenwood *[1]	64	35	46.8	16.04
Napa b	61	37	50.0	9.37
National City †	75	36	54.2	3.03
Needles †	69	35	53.7	1.46
Neenach *[1]	62	32	44.9	.....
Nevada City †	61	23	39.6	20.61
New Almaden *[s]	65	37	50.3	10.83
Newark *[s]	66	36	47.9	7.21
Newcastle a †	54	29	42.5	12.56
Newcastle b *[s]	59	31	46.0	8.70
Newhall *[s]	71	28	49.3	7.59
Newman *[s]	65	32	45.8	5.28
Niles *[s]	60	30	45.2	10.85
Nordhoff †	73	31	49.4	6.39
Norwalk *[s]	72	34	51.6	3.93
Oakdale a *[1]	60	30	45.0	7.71
California—Cont'd.				
Oakdale b *[s]	58	31	47.5	7.71
Oakland a	60	39	48.8	11.78
Oakland b *[s]	58	39	49.1	12.64
Ogilby *[s]	76	41	55.0	.....
Ontario a *[s]	69	32	51.3	7.45
Ontario b	70	32	52.5	7.71
Orangevale †	56	25	44.8	10.48
Orland *[s]	56	34	44.9	7.89
Ormonde †	.....	.....	.....	20.19
Oroville a *[s]	68	34	50.2	11.48
Oroville b	71	30	48.2	11.48
Pajaro *[s]	78	30	54.1	9.17
Palermo †	63	26	45.6	10.20
Palm Springs *[s]	79	40	54.3	4.25
Pasadena †	69	38	52.0	5.89
Paso Robles a *[s]	65	25	46.9	6.29
Paso Robles b	64	24	46.2	6.14
Petaluma *[1]	64	31	49.1	10.15
Piedras Blancas L.H	.....	.....	.....	7.56
Pigeon Point L. H	.....	.....	.....	6.74
Pilot Creek	.....	.....	.....	25.71
Placerville a *[s]	61	27	46.1	19.03
Placerville b	58	23	40.8	18.49
Pleasanton a *[s]	72	33	50.6	8.57
Pt. Ano Nuevo L. H	.....	.....	.....	9.35
Point Arena L. H	.....	.....	.....	14.32
Point Bonita L. H	.....	.....	.....	12.43
Pt. Conception L. H.	.....	.....	.....	4.35
Point Fermin L. H.	.....	.....	.....	2.52
Point George	.....	.....	.....	4.68
Pt. Hueneme L. H.	.....	.....	.....	3.77
Point Lobos	58	40	49.1	9.21
Point Loma L. H.	.....	.....	.....	1.25
Point Montara L. H.	.....	.....	.....	9.29
Point Pinos L. H.	.....	.....	.....	8.24
Point Reyes L. H.	.....	.....	.....	9.50
Point Sur L. H	.....	.....	.....	5.80
Pomona *[s]	65	30	49.5	7.60
Pomona (near)	78	34	54.0	8.48
Portersville *[s]	65	33	50.8	3.13
Port Los Angeles *[s]	62	47	55.5	3.73
Poway *[s]	.....	36	50.1	3.00
Puente *[s]	68	38	53.6	4.85
Ravenna *[s]	62	31	48.1	6.32
Red Bluff *[s]	67	38	47.7	10.57
Redding a *[s]	56	23	44.1	15.35
Redding b †	62	31	44.2	12.22
Redlands a	.....	.....	.....	7.38
Redlands b *[s]	74	38	52.6	4.35
Reedley (near) *[1]	66	36	49.5	3.95
Represa	58	27	40.4	12.56
Rio Vista	58	31	46.2	8.36
Riverside †	77	29	53.2	5.18
Rocklin *[s]	69	29	49.2	11.10
Roe Island L. H.	.....	.....	.....	7.40
Rosewood *[1]	60	22	43.0	12.63
Sacramento a	63	31	48.4	9.20
Sacramento b *[s]	.....	.....	.....	8.71
Sacramento c *[s]	56	33	46.3	8.71
Salinas *[s]	68	32	49.5	4.95
Salton *[s]	74	39	54.2	1.30
San Ardo a *[s]	65	33	47.2	4.42
San Bernardino †	70	30	49.7	7.25
San Gabriel *[s]	72	38	53.0	4.77
Sanger Junction *[s]	75	30	47.6	4.38
San Jacinto †	74	28	49.4	5.30
San Jose a *[s]	62	34	50.0	7.80
San Jose b	60	22	46.2	7.40
San Leandro *[1]	72	40	55.2	11.64
San Luis L. H	.....	.....	.....	8.28
San Luis Obispo a	.....	.....	.....	8.60
San Luis Obispo b *[s]	68	39	53.0	9.05
San Mateo *[s]	62	36	51.9	12.12
San Miguel *[s]	65	28	53.1	5.21
San Miguel Island †	66	42	53.7	4.80
San Pedro *[s]	71	42	57.6	3.86
San Rafael †	72	29	47.4	17.06
Santa Ana *†	68	40	53.8	4.98
Santa Barbara a	69	42	54.1	4.67
Santa Barbara b *[s]	72	46	54.9	4.16
Santa Barbara L. H.	.....	.....	.....	3.94
Santa Clara a *[s]	63	30	48.8	7.58
Santa Clara b	68	28	47.0	6.69
Santa Cruz a *[s]	64	36	50.3	12.89
Santa Cruz b †	70	35	54.2	13.71
Santa Cruz L. H.	.....	.....	.....	11.89
Santa Margarita *[s]	68	25	48.2	10.82
Santa Maria	74	30	54.2	3.86
Santa Monica *[s]	63	37	51.4	4.10
Santa Paula a *[s]	60	38	49.8	5.45
Santa Paula b †	67	33	47.4	5.00
Santa Rosa *[s]	64	29	50.7	13.14
Saticoy †	.....	.....	.....	4.60
Selma *[s]	65	31	48.0	3.35
Shasta Springs †	50	12	33.8	21.47
Shingle Springs *[s]	62	30	45.9	14.50
Sisson *[s]	48	12	31.6	11.13
Skye Valley	.....	.....	.....	5.18
Sneddens Ranch	.....	.....	.....	6.99
Soledad *[s]	66	32	49.7	2.73
SE. Farallone L. H.	.....	.....	.....	9.07
South Vallejo *[s]	65	38	49.3	7.55
Spadra *[s]	67	32	51.5	5.85
Squirrel Inn	.....	.....	.....	16.38
Stanford Univer'y	59	32	48.0	8.25

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
California—Cont'd.	°	°	°	*Ins.*
Stockton *a*	58	32	46.4	6.80
Stockton *b* *	60	37	49.4	7.87
Suisun City *	66	34	49.2	9.53
Summerdale †	.....	.....	.....	17.29
Summit *	42	10	36.7	.....
Susanville *†	48	7	31.8	8.66
Sutter Creek *	55	24	39.4	12.25
Tecarte Dam	.....	.....	.....	5.93
Tehachapi *a*	60	27	40.1	3.75
Tehama *	68	32	52.9	7.25
Templeton *	64	28	48.3	6.03
Towles *	59	24	37.9	13.88
Tracy *	57	32	47.0	4.46
Traver *	58	40	48.2	2.96
Trinidad L. H.	.....	.....	.....	9.86
Tropico *	76	36	52.6	4.82
Truckee *	38	— 4	25.7	13.95
Tulare *a*	63	32	50.2	2.39
Tulare *b*	.....	.....	.....	2.99
Tulare *c*	76	28	50.6	2.44
Tunnel No. 2	.....	.....	.....	14.96
Turlock *a* *	70	36	50.6	5.23
Turlock *b* †	60	29	45.8	5.38
Ukiah †	61	24	44.0	15.47
Upper Matole *	66	32	48.9	27.77
Vacaville *a*	64	34	49.0	12.80
Vacaville *b* *	67	37	48.3	13.27
Valley Springs *	63	33	49.0	10.51
Ventura †	68	39	53.0	3.13
Vina *	60	33	47.1	8.28
Volcano Springs *	79	38	59.4	1.00
Walnut Creek	61	30	44.8	10.04
Wenrich Ranch	.....	.....	.....	3.96
West Butte	.....	.....	.....	8.18
Westley *	59	30	49.7	4.67
West Point †	.....	.....	.....	16.28
Wheatland	62	30	45.8	10.75
Whittier *	68	40	55.5	5.03
Williams *	62	30	46.9	7.27
Willows *	62	35	48.7	9.39
Wilmington *	70	39	57.0	.....
Winchester †	73	36	50.6	4.98
Winters *	75	34	45.3	14.70
Wire Bridge *	57	26	45.8	13.31
Woodland *	60	38	47.9	10.69
Yerba Buena L. H.	.....	.....	.....	7.60
Yreka †	53	4	31.6	5.40
Yuba City *	65	34	46.3	11.15
Colorado.				
Abbott	.....	.....	.....	0.16
Alma †	43	—23	18.4	1.09
Antlers †	50	— 2	28.4	1.33
Avoca	.....	.....	.....	0.40
Boulder †	63	— 6	31.6	0.67
Box Elder	.....	.....	.....	1.45
Breckenridge †	50	—25	17.5	2.90
Byers *[1]	64	—14	25.4	.....
Canyon †	69	—11	34.3	0.64
Castle Rock †	60	.....	.....	0.31
Climax *† [1]	36	— 8	14.6	3.90
Collbran	.....	.....	.....	2.54
Colorado Springs †	69	— 8	29.9	0.42
Cope †	65	—10	29.9	0.54
Craig	.....	.....	.....	0.80
Crook	66	—30	23.8	0.47
Deer Trail *	67	—10	33.5	.....
Delta †	58	— 4	31.0	0.80
Divide Ex. Station	60	—13	28.1	1.18
Downing †	70	— 4	29.1	0.45
Dumont	58	— 6	28.9	0.95
Durango †	53	4	33.0	3.45
First View *	70	—10	32.0	.....
Fleming	.....	.....	.....	0.86
Fort Collins †	65	—24	25.6	0.76
Garnett	.....	.....	.....	T.
Glen Eyrie †	61	— 3	31.0	0.28
Gold Hill *	65	—12	34.4	1.38
Grand Junction †	58	17	34.7	0.78
Greeley †	.....	.....	.....	0.44
Gunnison †	40	—28	8.4	0.16
Holly	.....	.....	.....	0.10
Holyoke	.....	.....	.....	0.42
Hotchkiss	.....	.....	.....	1.18
Hugo *	64	—14	28.9	.....
Hugo (near) †	64	—13	28.0	0.17
Husted †	66	—13	31.2	0.40
Julesburg †	63	—25	23.2	0.18
Kit Carson *[1]	66	— 8	31.2	.....
La Jara †	54	— 4	28.0	0.18
Lake Moraine †	46	—24	22.8	0.22
La Porte	.....	.....	.....	1.14
Las Animas †	78	—24	30.2	1.15
Lavender †	54	—20	27.0	1.15
Lay *† [1]	50	—19	19.0	1.60
Le Roy *† [1]	57	—13	27.7	0.65
Leslie	.....	.....	.....	0.20
Loveland	.....	.....	.....	0.92
Meeker †	54	—14	24.5	1.34
Minneapolis †	78	—16	35.3	0.40
Monte Vista	50	—11	23.2	T.
Moraine †	53	—16	26.6	1.58
Ouray †	48	1	27.9	3.64
Pagoda (near) †	47	—21	19.7	2.75
Paonia †	.....	.....	.....	1.98
Parachute †	58	6	32.6	2.61
Colorado—Cont'd.	°	°	°	*Ins.*
Rangely †	48	— 6	22.0	0.75
Red Cliff	.....	.....	.....	2.40
Rico	.....	.....	.....	5.13
Rocky Ford †	75	—23	31.1	0.65
Ruby †	.....	.....	.....	11.81
Saguache †	46	— 6	21.6	0.15
St. Cloud	.....	.....	.....	2.00
San Juan †	48	—22	13.9	1.85
San Luis †	58	—12	25.8	0.55
Santa Clara *† [1]	60	—11	26.2	1.40
Scissors †	.....	.....	.....	1.60
Seibert †	.....	.....	.....	0.47
Smoky Hill Mine †	65	— 7	31.4	1.00
Springfield †	.....	.....	.....	0.35
Spring Gulch †	.....	.....	.....	1.68
Stamford *[1]	52	—14	24.4	2.15
Sunnyside *[2]	50	2	26.8	0.87
Surface Creek †	52	4	30.6	2.80
Thon †	65	—10	31.4	0.40
T. S. Ranch †	58	7	31.6	1.58
Twin Lakes	.....	.....	.....	0.74
Vernon †	70	—17	31.6	0.24
Vilas	.....	.....	.....	0.50
Wallet †	.....	.....	.....	0.40
Watkins *[1]	64	4	34.1	.....
Yuma	.....	.....	.....	0.70
Connecticut.				
Bridgeport *[1]	54	6	31.5	4.69
Canton	50	— 3	27.6	3.77
Colchester	56[e]	3[e]	32.5[e]	4.08
Falls Village	.....	.....	.....	4.58
Greenfield Hill	.....	.....	.....	4.40
Hartford *b*	.....	.....	.....	4.63
Hartford *c*	50	4	29.4	.....
Lake Konomoc	.....	.....	.....	4.68
Middletown	55	4	30.1	4.85
N. Grosvenor Dale	57	— 6	25.8	3.69
Norwalk	54	2	31.1	4.11
Southington *[1]	50	0	28.6	4.05
South Manchester	.....	.....	.....	3.67
Storrs	52	2	28.4	4.31
Thompson *[1]	52	2	27.4	.....
Voluntown †	56	2	31.0	4.47
Wallingford †	.....	.....	.....	4.09
Waterbury	54	3	31.2	4.21
West Simsbury	.....	.....	.....	4.09
Windsor	47	0	27.4	4.54
Delaware.				
Dover †	64	10	37.6	3.39
Kirkwood [2]	.....	.....	33.1[e]	.....
Milford	61	10	40.0	2.80
Millsboro	67	9	37.6	2.37
Newark	56	6	34.4	2.65
Seaford †	68	9	38.1	2.38
Wilmington †	55	7	37.0	5.30
District of Columbia.				
Dist'ing Reserv'r *[3]	52	7	36.8	3.14
Rec'ing Reserv'r *[3]	53	7	36.4	3.22
West Washington	63	6	38.0	3.98
Florida.				
Amelia †	78	16	56.0	0.76
Archer †	83	13	58.7	0.45
Avon Park †	83	21	63.2	0.69
Brooksville †	80	17	59.2	2.30
Clermont †	83	20	60.9	1.22
De Land †	82	16	59.2	.....
Eustis †	82	16	61.2	1.41
Federal Point †	80	17	57.7	1.73
Fort Meade †	82	22	61.2	1.41
Grasmere †	81	17	61.0	0.69
Green Cove Sp'gs †	79	14	54.2	1.11
Homeland †	78[1]	20[1]	57.0[1]	0.94
Hypoluxo *† [1]	85	26	68.5	0.73
Kissimmee †	86	19	62.5	2.54
Lake City †	79	17	58.8	2.51
Manatee †	81	19	61.2	0.52
Merritts Island †	79	22	64.0	1.30
Moseley Hall †	78	13	56.3	3.20
Mullet Key †	75	23	60.1	0.40
Myers †	84	24	63.8	0.24
New Smyrna †	81	17	59.2	0.09
Oak Hill *[1]	78	21	63.8	.....
Ocala *† [1]	80	17	58.1	1.38
Orange City †	84	18	60.5	0.36
Orange Park †	79	14	55.5	0.82
Orlando †	83	18	62.2	0.56
Plant City †	86[1]	19[1]	66.4[1]	1.82
St. Francis B'ks	83	16	58.2	0.20
Tallahassee †	77	12	54.2	3.29
Tarpon Springs †	81	19	60.1	0.87
Georgia.				
Adairsville †	69	5	44.0	6.89
Alapaha † [4]	79	11	53.0	2.10
Albany †	76	12	52.8	4.20
Americus †	75	8	52.3	2.64
Athens *a*	72	4	45.2	4.39
Athens *b* †	72	6	42.9	5.16
Bainbridge *b* †	.....	.....	.....	2.17
Blakely *† [5]	76	12	53.2	3.89
Brag †	80	8	51.9	0.64
Camak †	74	8	45.2	.....
Canton †	.....	.....	.....	7.98
Clayton †	66	2	41.4	8.19
Columbus †	78	11	52.8	5.43
Covington	73	6	47.4	4.75
Georgia—Cont'd.	°	°	°	*Ins.*
Dahlonega †	71	1	45.2	8.38
Darien †	81	.....	.....	0.40
Diamond †	.....	.....	.....	9.62
Dublin *b* †	.....	.....	.....	2.49
Elberton †	73	5	47.2	5.28
Fleming †	81	11	50.7	0.59
Forsyth *[1]	80	10	51.8	4.75
Fort Gaines †	75	12	52.0	4.39
Gillsville *† [1]	70	15	47.7	5.45
Griffin †	68	5	42.3	3.30
Hawkinsville †	79[k]	23[k]	52.7[k]	2.55
Hephzibah *† [6]	72	10	50.3	2.30
Lagrange †	74	4	47.4	4.78
Louisville †	76	7	48.9	2.64
Macon *b* †	.....	.....	.....	3.87
Marietta †	71	4	45.4	6.74
Marshallville †	74	9	51.5	4.06
Monticello *† [1]	71	8	49.2	1.00
Morgan †	75	10	52.0	2.93
Piscola	79	13	55.0	0.90
Point Peter *[1]	62	8	45.2	5.05
Poulan †	77	11	51.4	1.44
Quitman †	79	12	53.4	0.95
Ramsey †	69	2	46.6	5.90
Resaca †	.....	.....	.....	6.95
Reynolds †	.....	.....	.....	4.03
Rome †	67	8	44.3	6.27
Talbotton †	72	7	48.4	4.90
Thomasville †	78	13	54.8	1.81
Toccoa †	70	0	45.0	11.11
Washington †	70	8	47.9	3.59
West Point † [b]	71	7	49.2	4.83
Whitesburg †	.....	.....	.....	4.91
Idaho.				
American Falls †	48	—10	22.2	0.87
Atlanta †	40	— 6	23.5	2.09
Bliss †	57	5	32.8	0.35
Boise Barracks †	56	5	31.2	1.98
Chesterfield †	48	—22	16.3	1.37
Fort Sherman †	43	6	29.7	1.30
Fraser †	44	1	27.8	1.48
Garden Valley †	41	—14	22.0	2.77
Grangeville	45	— 3	27.6	2.04
Hailey †	53	— 8	20.2	1.97
Idaho City †	64[d]	11[d]	24.2[d]	4.02
Kootenai †	39	— 8	24.2	4.50
Lake †	36	18	16.8	3.50
Lewiston †	52	10	34.0	0.66
Lost River †	.....	.....	.....	1.72
Lucas †	.....	.....	.....	4.17
Martin †	43	—17	17.0	1.95
Moscow †	48	3	29.7	1.15
Murray †	39	— 9	24.2	2.09
Nampa	50	4	28.0	1.27
Oakley †	53	— 2	27.9	0.60
Paris †	59	—19	22.4	1.65
Payette †	62	— 1	30.7	1.98
Salubria †	52	—19	23.5	3.27
Swan Valley †	45	—15	20.2	0.89
Illinois.				
Albion †	62	0	36.8	4.07
Aurora †	55	— 5	31.0	0.96
Beardstown †	.....	.....	.....	1.43
Bloomington †	63	— 5	32.8	1.86
Braidwood †	64	— 1	35.4	1.00
Bushnell †	62	— 2	31.5	1.15
Carlinville †	60	— 1	35.4	1.90
Carlyle	.....	.....	.....	2.92
Carrollton	66	— 2	38.0	3.47
Chemung *† [1]	52	— 6	29.9	0.60
Chester †	.....	.....	.....	3.93
Clear Creek †	61	— 2	33.4	1.11
Decatur †	61	— 3	35.4	2.65
Dixon †	54	— 4	29.9	0.53
East Peoria †	61[e]	— 1[e]	34.5[e]	2.15
Effingham †	62[d]	0[d]	36.6[d]	1.05
Evanston *[10]	56	— 6	32.5	.....
Fort Sheridan †	53	— 3	31.7	1.26
Galva †	54	— 0	30.2	0.62
Gilman †	58	— 4	32.5	1.73
Golconda †	67	0	41.5	5.41
Grafton †	.....	.....	.....	3.04
Greenville †	66	— 2	36.8	2.73
Griggsville †	60	— 3	35.5	1.32
Halliday *[2]	62[e]	2[e]	35.5[e]	3.49
Havana †	65	0	37.6	1.97
Herrins Prairie *[1]	62	4	40.4	2.60
Jordans Grove †	71	2	40.1	2.84
Kankakee †	59	— 4	32.1	0.94
Lagrange †	55	— 1	32.6	0.71
Louisville †	64	1	37.4	3.00
Martinsville †	59	1	34.9	3.49
Mascoutah *[2]	64	0	39.4	3.63
Mattoon *[1]	58	5	35.4	1.72
Monmouth †	55	— 4	33.2	1.49
Mount Carmel †	.....	.....	.....	4.48
Mount Pulaski	59	— 2	34.5	2.43
Olney *a* *[1]	63	2	37.8	3.34
Olney *b* *[1]	60	— 2	32.4	2.89
Oswego *[2]	54	— 6	29.5	0.77
Ottawa †	58	— 5	31.3	1.19
Palestine †	64	0	35.8	2.22
Paris †	60	— 3	34.3	1.51
Peoria *a* †	.....	.....	.....	1.58
Peoria *b*	57	— 2	34.5	1.58
Illinois—Cont'd.	°	°	°	*Ins.*
Philo †	60	— 3	33.2	2.19
Rantoul *† [2]	58	— 5	32.3	1.16
Riley †	52	— 5	29.7	0.44
Rushville	68	— 1	36.4	1.70
St. John *† [2]	62	2	35.6	2.74
Streator †	60	— 4	35.4	2.10
Sycamore *† [1]	52	— 5	30.8	0.74
Tuscola *† [1]	61	— 2	33.0	1.40
Walnut †	55	— 5	30.6	0.61
Winnebago †	53	— 4	30.4	0.33
Zion †	54	— 7	31.6	0.63
Indiana.				
Angola *[1]	58	0	32.5	2.01
Butlerville †	63	— 3	36.5	4.70
Cambridge City †	58	— 2	34.3	3.41
Cannelton †	63	3	39.5	4.47
Columbia City *[1]	55	0	32.6	1.64
Columbus †	62	1	36.1	4.30
Connersville †	61	— 2	35.0	2.84
Degonia Springs *	64	3	38.2	4.60
Delphi	63	— 2	35.6	1.99
Edwardsville *† [1]	65	0	38.9	5.24
Evansville †	63	1	37.7	5.13
Farmland †	60	2	34.9	1.33
Hammond †	58	— 7	33.1	2.48
Huntingburg †	66	2	38.3	3.87
Huntington	59	5	33.4	1.87
Jasper †	63	1	38.0	4.79
Jeffersonville	65	2	38.5	4.69
Kokomo †	58	0	35.0	1.35
Laconia	65	— 1	35.1	4.34
Lafayette †	59	— 5	33.4	2.33
Logansport *a* †	.....	.....	.....	2.09
Logansport *b*	58	2	35.6	1.26
Madison †	65	— 3	38.3	3.84
Marengo *[1]	66	— 8	35.9	7.15
Marion †	60	2	34.8	1.54
Mauzy †	60	— 6	33.7	3.39
Mount Vernon †	.....	.....	.....	4.80
Plymouth †	58	0	33.8	1.67
Princeton *† [3]	62	1	37.7	4.45
Rockville †	58	— 3	33.9	2.95
Rushville †	.....	.....	.....	3.45
Scottsburg [1]	64*	— 2	35.3	5.08
Seymour †	62	6	36.5	4.23
South Bend †	54	4	33.0	1.09
Terre Haute †	61	1	38.2	3.22
Valparaiso †	55	— 4	35.0	1.30
Vevay	66	0	37.2	1.93
Vincennes †	61	— 1	36.4	3.47
Worthington †	61	2	35.9	3.62
Indian Territory.				
Eufaula †	.....	.....	.....	2.70
Healdton †	80	4	47.7	2.26
Kemp †	79	5	47.2	1.27
Lehigh †	80	5	44.8	1.82
Purcell †	75	1	43.8	2.72
Tulsa †	.....	.....	.....	1.30
Iowa.				
Afton	60	— 9	30.0	1.10
Algona *[1]	55	—13	28.4	0.97
Alta †	54	—14	27.4	0.98
Amana †	58	— 3	30.3	1.34
Ames *b*	61	—14	29.0	0.64
Ames *c*	.....	.....	.....	0.86
Atlantic †	65	— 6	29.5	0.97
Atlantic (near)	60	— 9	30.8	0.70
Audubon	60	—10	30.3	0.75
Belle Plaine	59	— 3	28.9	0.80
Bonaparte †	61	— 2	33.2	0.52
Carroll	60	—13	29.6	0.96
Cedar Falls †	57	— 6	28.8	1.40
Cedar Rapids †	61	— 1	32.6	1.19
Centerville †	.....	— 8	.....	4.10
Charles City †	56	— 8	29.1	1.39
Clarinda †	62	— 7	30.6	0.99
Clinton	55	— 4	31.2	0.63
College Springs	63	— 7	31.2	0.90
Corning †	65	— 6	32.9	0.84
Cresco †	50	— 7	26.4	1.07
Decorah †	56	— 6	28.7	1.75
Delaware *[2]	52	— 3	27.6	1.03
Elkader †	54	— 6	29.0	0.91
Emmetsburg	53	—14	27.8	1.20
Fairfield †	61	1	31.6	0.64
Fayette	54	— 5	29.1	1.45
Forest City *	53	—13	26.1	0.73
Fort Madison *† [1]	60	3	35.2	1.12
Galva †	58	—12	29.5	0.95
Glenwood †	70	—10	31.1	0.80
Grand Meadow *[1]	54	— 6	28.6	1.18
Greenfield †	63	—10	31.3	0.88
Grundy Center	60	— 5	28.7	1.02
Hampton	58	—10	26.5	1.10
Hawkeye	.....	.....	.....	1.41
Hopeville †	64	— 8	31.3	0.86
Hopkinton *	52	2	29.5	1.10
Humboldt †	.....	.....	.....	1.06
Independence †	56	— 6	29.3	0.95
Indianola †	66	— 9	31.8	0.90
Iowa City †	58	— 3	31.5	0.98
Iowa Falls †	58	—11	28.1	0.89
Jefferson †	66	—10	33.2	1.30
Keosauqua †	63	0	34.8	0.65
Knoxville	73	— 5	30.7	0.90

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Iowa—Cont'd.	°	°	°	*Ins.*
Larrabee †	54	−14	27.8	1.29
Le Claire †				0.40
Logan †	60	— 8	31.1	1.14
Mason City †	50	−11	26.4	1.06
Maxon	64	— 4	31.3	0.25
Mechanicsville	53	— 3	30.7	0.94
Monticello *† [1]	56	— 3	28.9	0.97
Moocar	64	— 2	34.2	0.95
Mount Pleasant *[2]	58		32.8	0.64
Mount Vernon *[1]	61	— 6	30.0	
Newton	62	— 7	31.2	1.30
North McGregor †				0.80
Ogden	64	−13	29.3	0.98
Osage *† [3]		— 8	25.3	1.33
Osceola	62	— 8	30.2	0.98
Oskaloosa †	65	— 3	31.7	0.62
Ottumwa	66	— 2	34.2	0.66
Ovid †	62	— 5	32.3	0.73
Panama †	57	— 9	30.0	1.24
Richland *[1]	60	1	31.2	0.78
Rock Rapids	54	−17	27.6	1.00
Rockwell City	60	−14	26.9	1.31
Sac City †	57	−14	27.5	1.75
Seymour †	65	— 5	33.7	1.20
Sibley	50	−16	26.6	1.15
Spirit Lake †	53	−17	28.4	0.90
Toledo *[1]	56	— 5	29.8	0.88
Villisca †	63	— 6	31.2	0.88
Vinton *[1]	56	— 2	30.4	0.74
Washington †	61	— 5	31.4	0.72
Waukee	56	— 9	32.8	0.89
Webster City *[1]	57	−12	27.6	0.90
Williams *[1]	58	−13	26.6	1.18
Wilton Junction †	57	— 5	30.9	0.70
Winterset †	65	−10	30.0	1.03
Kansas.				
Abilene †	72	— 4	36.2	0.90
Achilles *[2]	72	−11	22.8	0.95
Allison *† [2]	65	— 9	27.6	0.84
Altoona *† [2]	66	— 3	34.5	1.46
Atchison †	68	— 5	35.7	1.05
Beloit †				0.62
Blaine *[1]	65	— 6	32.8	2.75
Burlington †	72	— 4	36.0	1.08
Coffeyville *[1]	75	0	37.8	1.67
Colby †	73	−16	30.2	0.60
Coldwater †	75	−14	35.3	0.45
Collyer *[6]	75	−10	31.2	0.95
Columbus †	70	— 5	36.6	1.65
Coolidge †	77	−17	31.0	0.20
Cunningham †	72	−14	36.2	0.77
Downs				0.70
Eldorado †	70	0	39.3	0.50
Elk City *[1]	70	— 4	37.6	1.22
Ellinwood				1.72
Emporia †	75	— 1	38.0	1.15
Eureka Ranch †	72	−15	29.6	1.33
Fort Riley †	71	— 5	36.7	0.28
Frankfort	76	— 4	37.6	0.85
Garden City †	77	−17	30.7	1.00
Garfield				0.62
Gibson *[1]	70	−13	26.8	0.95
Gove *† [1]	85	−11	32.3	0.77
Grainfield *[6]	70	−10	35.4	0.70
Grenola *[1]	73	— 6	38.6	0.90
Grinnell *[6]	78	— 8	32.3	
Halstead	68	−16	33.2	1.04
Hays City †	78	−21	31.6	0.75
Horton †	65	— 3	35.6	0.80
Hutchinson †	80	−14	38.4	1.53
Independence †	71	— 5	37.2	1.82
Ionia †	69	— 9	33.4	0.35
Jaqua †	74	−15	31.6	0.55
Johnson †	77	−14	34.1	0.15
Kiowa †	85	−15	38.6	0.17
Lakin †	85	−13	39.0	0.45
Lawrence	72	0	37.0	0.96
Lebo †	74	— 3	38.5	1.45
Leoti	77	−18	31.0	0.43
Macksville †	75	−15	36.1	0.80
McPherson †	70	−13	34.4	0.93
Manhattan *b*	73	— 4	36.6	0.38
Manhattan *c* *[1]	65	— 4	32.1	0.37
Medicine Lodge				0.27
Minneapolis †	69	— 6	34.2	0.77
Morland †	73	−12	33.1	1.24
Morton †	75	— 8	34.6	1.10
Mount Hope *[1]	72	— 9	38.4	1.36
Ness City †	71	— 2	34.7	0.95
New Eng. Ranch †	71	−20	27.1	0.59
Oberlin †				1.10
Oswego †	74	−13	37.4	1.23
Phillipsburg †	70	— 8	28.6	1.03
Pleasant Dale †	75	−14	32.1	1.42
Quinter *[1]	75	−10	31.6	0.60
Rome *† [1]	74	−10	38.0	0.70
Salina †		— 6		1.40
Sedan †	72	— 7	39.4	2.03
Sharon Springs *[1]	76	— 8	36.2	0.25
Wa Keeney *[1]	66	— 8	33.0	0.60
Wakefield *[1]	70	— 1	36.1	1.03
Wallace *a*				0.35
Wamego *[1]	68	— 1	45.8	0.35
Wellington *[1]	76	−10	30.1	1.20
Winfield *[5]	72	— 8	36.5	0.26

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Kansas—Cont'd.	°	°	°	*Ins.*
Winona *[6]	66		31.9	0.22
Yates Center †	68	−10	36.1	1.17
Kentucky.				
Alpha *† [1]	69	— 4	46.1	6.05
Blandville †	65	— 2	39.9	3.48
Bowling Green *[1]	67	— 4	37.0	3.45
Bowling Green *b* †	76	— 1	38.2	2.84
Burnside †				4.00
Caddo †	64	— 2	38.3	5.00
Canton *† [1]	68	— 5	39.9	2.44
Carrollton †	72	— 4	37.3	4.26
Catlettsburg *† [6]	57	0	39.8	4.59
Earlington	68	3	40.0	4.39
Eddyville *† [1]	69	0	40.9	2.78
Edmonton †	67	— 3	37.3	4.21
Eubank †	67	— 7	37.6	4.07
Falmouth †				3.67
Fords Ferry † [1]	68	0	40.6	5.46
Franklin *† [1]	73	1	41.1	2.81
Georgetown	64	— 8	37.7	
Greendale *[1]	64	— 4	36.6	4.08
Greensburg *† [1]	67	— 5	37.4	3.94
Harrodsburg †	66	— 5	37.1	4.08
Henderson †	68	4	42.2	5.89
Louisa †				4.08
Marrowbone †	70	— 4	38.3	3.41
Matlock	68	2	40.0	5.25
Middlesboro † [2]	62	0	39.2	3.22
Mount Sterling †	64	— 6	35.1	5.53
Munfordville *† [1]	67	— 8	39.6	3.18
Paducah *a* †				3.90
Paducah *b* †	68	2	41.5	3.75
Pellville †	67[d]	— 1[d]	41.9[d]	3.73
Pleasure R'dge P'rk	68	2	38.4	4.54
Princeton †	66[g]		42.2[g]	2.76
Richmond † [1]	65	0	37.2	5.45
Russellville †	70	0	40.6	3.28
Sandy Hook †	64	−11	39.5	5.54
Shelby City *[1]	62	— 2	37.8	4.17
Shelbyville †	65	— 6	35.5	4.81
South Fork † [2]			36.7	3.95
Springfield †	65	— 7	36.5	4.38
Winchester †				3.36
Louisiana.				
Abbeville	84	16	57.0	3.05
Alexandria †	81	10	51.4	2.98
Amite †	85	10	56.2	2.23
Bastrop †	83	10	49.8	4.55
Baton Rouge †	83	14	56.0	2.57
Calhoun †	72	12	48.9	6.17
Cameron †	86	20	58.2	0.90
Cinclare	85	12	53.6	2.50
Clinton †	78	12	51.5	4.85
Coushatta *a* †				3.62
Coushatta *b* †	80	10	51.5	4.07
Covington †	79	9	53.6	3.10
Delhi †				6.42
Donaldsonville †	84	19	57.0	3.55
Emilie †	79	16	54.8	2.82
Farmerville	79	10	47.4	4.34
Franklin †	83	16	56.6	2.59
Grand Coteau	82	17	56.1	1.44
Hammond †	81	10	54.6	5.14
Houma †	82	23	59.2	1.38
Jeanerette †	84	16	57.4	3.06
Lafayette †	84	14	55.5	2.17
Lake Providence †	81	9	48.1	3.20
Lawrence †	79°	22°	55.6°	1.80
Liberty Hill	85	7	51.2	3.88
Maurepas °	89	12	55.9	3.82
Melville †	87	12	55.4	2.30
Monroe †	79	14	51.2	3.33
Natchitoches †	81	10	52.2	1.24
New Iberia	78	19	55.9	2.93
Opelousas †	82	11	55.6	1.34
Oxford †	83	8	50.7	2.82
Paincourtville †	81	11	55.5	3.55
Plain Dealing †	75	6	47.7	2.75
Rayne †		13		3.05
Schriever †	82	13	54.4	0.52
Shell Beach	79	13	54.7	2.96
So. University *[1]	83	25	60.8	2.10
Sugar Ex. Station †	82	19	55.0	2.40
Sugartown †	78	5	50.0	5.11
Thibodeaux				1.33
Wallace	81	20	56.6	2.92
West End				1.10
Winnsboro	82			3.00
Maine.				
Belfast *[6]	47	1	24.5	3.83
Calais †	52	— 2	25.0	3.83
Cornish *[1]	48	0	24.3	3.00
Easton †	42	−10	21.0	
Fairfield	45	−10	23.9	1.82
Farmington †	49	— 9	22.4	2.76
Gardiner	47	— 7	24.0	2.80
Houlton †	46	−18	18.4	3.73
Indian Stream	44[d]	−14[d]	18.8[d]	2.27
Lewiston	50	— 5	22.4	2.98
Madison *[1]	48	−12	22.5	
Orono †	49	— 7	21.4	1.75
Petit Menan *[1]	43	4	27.2	
West Jonesport *[1]	46	— 3	26.7	
Maryland.				
Bachmans Val. *[1]	48	0	30.7	4.34

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Maryland—Cont'd.	°	°	°	*Ins.*
Bel Alton	64	8	40.1	2.55
Boettcherville *[1]	60	0	34.0	3.50
Charlotte Hall †	58	7	37.6	1.74
Cherryfield *† [2]			38.3	2.85
Chestertown †	56	9	36.4	2.98
College Park	56°	17°	38.6°	3.86
Cumberland *a* †	56	2	33.0	2.63
Cumberland *b*	59	2	38.4	2.39
Darlington †	58	3	34.8	4.03
Deer Park	50	−10	29.8	3.36
Denton †	72	9	37.6	2.81
Easton †	64	12	40.9	2.60
Fallston *[1]	52	7	35.1	3.33
Frederick *a*	56	5	36.0	3.24
Frederick *b*	57	5	36.8	
Grantsville	61	— 7	33.0	3.86
Great Falls *[6]	55	5	35.6	4.38
Jewell †	62	8	38.8	2.82
Johns Hopkins Hos	59	7	36.3	
La Plata †	64	6	36.2	3.50
Mardela Springs †	67	12	38.6	1.43
Marshall Hall	60	20	40.9	2.10
Mt. St. Marys Col. † [1]	53°	2	34.4	2.67
Oakland †	58	— 6	30.6	5.18
Pocomoke City	72	11	41.9	2.01
Princess Anne	66	12	39.0	1.67
Sharpsburg	55	— 1	35.0	2.78
Solomons †	60	11	40.6	3.21
Sunnyside	65	−10	30.3	5.26
Taneytown †				3.22
Upper Marlboro †	59	6	35.4	3.74
Western Port	60	— 6	32.6	2.18
Woodstock	55	3	34.5	1.41
Massachusetts.				
Adams	55	4	28.6	
Amherst	48	— 5	27.0	4.05
Amherst Ex. St'n *a*	49	— 7	25.2	3.42
Amherst Ex. St'n *b*	51	— 4	26.9	3.53
Andover	54	1	29.8	3.95
Ashland				4.81
Bedford	50	2	27.8	2.68
Beverly Farms	54	3	29.6	5.68
Blue Hill (sum't)	54	3	29.7	4.40
Blue Hill (valley)	55	1	28.5	4.41
Boston				4.62
Brockton *a*	57	6	31.6	5.24
Brockton *b*				5.12
Brockton *c*				4.79
Cambridge *a*	55	5	29.7	4.32
Cambridge *b*	53	5	29.2	4.43
Chestnut Hill	55	5	30.4	4.06
Clinton				2.75
Concord †	53	0	27.0	3.11
Dudley	48	1	25.3	3.30
East Templeton *[1]	48	— 2	25.2	3.74
Egg Rock, Nahant	50	5	30.8	
Fall River *[1]	58	7	32.8	5.41
Fiskdale				1.92
Fitchburg *a* *[1]	48	3	26.6	3.28
Fitchburg *b*	50	0	27.3	3.46
Framingham	52	0	27.6	4.81
Gilbertville	60°	— 2°	26.8°	2.05
Groton	49	— 1	25.8	2.89
Hingham				5.31
Hobbs Brook				4.47
Hyannis	56	10	36.2	5.44
Lake Cochituate	55	— 8	26.8	4.38
Lawrence	49	— 2	27.0	3.15
Leeds	51	−11	26.1	4.64
Leominster *[6]	50	1	27.9	2.73
Long Plain *[6]	56	6	30.5	6.19
Lowell *a*	50	1	27.1	3.84
Lowell *b*	53	— 2	27.3	
Lowell *c*	55	2	29.6	
Ludlow Center	46	— 1	24.5	3.91
Lynn *a*	52	5	28.8	4.25
Lynn *b*	58	6	30.5	
Mansfield *[1]	55	6	28.2	5.47
Middleboro	58	4	29.6	4.91
Milton	54	6	31.2	4.48
Monroe	45	−12	23.4	4.89
Monson	53	— 2	27.6	2.60
Mount Nonotuck				4.08
Mystic Lake				3.97
Mystic Station				4.46
Natick *[1]	50	3	26.8	5.25
New Bedford *a*	55	6	32.0	5.73
New Bedford *b*	58	7	32.9	5.57
Newburyport				2.39
North Billerica	55	5	30.8	3.60
Pittsfield	46	— 4	25.0	3.35
Plymouth *[1]	56	9	34.2	5.78
Provincetown	53	12	34.6	4.88
Randolph				3.30
Roberts Dam				4.58
Roxbury	55	8	32.1	4.75
Salem				4.31
Salisbury				2.70
Somerset *[1]	58	6	33.0	5.08
Springfield Arm'ry	49	3	28.9	3.50
Taunton *b*	57	7	31.5	5.74
Taunton *c*	57	3	31.0	5.62
Taunton *d*	59	5	30.8	4.87
Turners Falls	48	— 8	25.8	3.18
Wakefield †	51	1	28.5	3.27

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Massachusetts—Con.	°	°	°	*Ins.*
Waltham				4.30
Webster				3.98
Wellesley	62°	−15°	27.4°	3.12
Westboro †	55	0	29.5	3.78
Williamstown	50	−10	27.1	
Winchendon				3.25
Winchester				4.18
Winthrop	52	6	30.8	4.25
Worcester *a*	50[k]	11[f]	31.8[i]	3.02
Worcester *c* *[1]	48°	1	26.6	
Michigan.				
Adrian	55	— 2	32.0	2.33
Albion	54	0	31.2	2.65
Allegan	55	4	32.7	1.44
Alma	53	−12	30.5	0.54
Ann Arbor	54	— 4	31.2	1.47
Arbela *[2]			29.2	0.67
Ball Mountain	57	— 9	30.2	1.62
Bear Lake	47	2	29.6	
Benzonia	47[d]	3[d]	29.1[d]	1.47
Berlin *[1]	53	−10	28.8	1.47
Berrien Springs *a* *[1]	55	10	34.0	0.80
Birmingham	54	— 3	30.6	1.04
Boon	49	−17	26.6	2.02
Bronson	55	— 6	31.0	0.75
Brown City †	54	— 8	31.4	0.53
Calumet	47	— 3	25.6	1.87
Charlevoix	50	0	31.0	1.40
Cheboygan	49	−18	27.8	1.95
Climax [2]			29.6°	
Clinton	55	— 4	31.9	1.27
Fairview	59	— 2	32.2	0.31
Fitchburg	54	— 8	29.5	1.45
Flint	55	−10	29.8	0.98
Frankfort *[10]	50	10	36.0	
Gladwin	51	−10	28.6	
Grand Rapids	53	1	32.4	0.67
Grape	56	— 4	33.0	1.60
Grayling	46	−18	25.1	1.60
Grindstone City *[9]	50	4	30.9	
Hanover	56	— 2	34.8	1.38
Harbor Springs	49	−15	29.8	1.57
Harrison	52	−11	27.6	0.05
Harrisville	54	−12	27.9	2.03
Hart	50	5	27.8	1.80
Hayes	50	— 3	32.2	0.50
Hesperia	53	2	28.0	
Highland Station	54	— 8	30.6	0.97
Holland *[9]	48	8	34.8	
Howell	56	— 8	30.2	0.79
Ivan	51	−12	28.3	0.97
Jeddo	51	— 5	30.6	1.19
Kalamazoo	56	4	32.6	1.08
Lansing	56	— 5	30.6	1.14
Lathrop *[1]	45	— 6	24.6	1.97
Lewiston	51	−16	26.6	0.80
Ludington *[9]	50	8	33.0	
Madison	54	— 3	31.4	1.37
Manistee *[10]	48	4	29.5	
Mayville	54	— 9	30.8	1.07
Middle Island *[10]	49	4	31.4	
Mottville	57	0	33.1	1.09
N. Manitou Isl'd *[10]	48	6	31.6	
North Marshall	54	— 5	28.3	1.23
Northport	52	4	33.0	2.48
Old Mission	50	0	30.5	0.66
Ottawa Point *[9]	50	— 8	31.2	
Ovid	56	— 6	30.6	1.00
Paris	53	−10	26.8	1.08
Parkville				1.38
Pt. aux Barques *[10]	51	4	31.1	
Point Betsey *[9]	48	8	33.8	
Rawsonville	54	— 4	31.2	1.30
Rockland	53°	−14°	25.0°	1.50
Romeo	51	— 6	30.4	1.12
St. Ignace	49	−13	28.2	1.75
St. Johns	56	— 6	32.4	0.80
Sand Beach *a*	55	— 2	31.8	0.90
Sand Beach *b* *[9]	52	3	32.9	
Stanton	52	— 9	30.0°	0.49
Sturgeon Point *[10]	60	−12	33.9	
Thornville	53	— 6	32.6	0.66
Thunder Bay I'd *[10]	43	0	29.6	
Vandalia	65	4	34.2	1.23
Ypsilanti	53	— 7	30.6	1.30
Minnesota.				
Ada †	45	−24	17.8	0.16
Alexandria *a* †				0.10
Beardsley †	56	−20	24.9	0.07
Belle Plaine *[1]	48	−14	20.3	0.20
Bingham Lake †	50	−20	25.9	0.93
Bird Island	50	−18	24.5	0.95
Blooming Prairie *[1]	48	−10	24.4	0.62
Bonniwells Mills †	47	−16	25.0	1.09
Caledonia † [2]	52	— 8	26.6	1.27
Cambridge †	48	−16	25.6	1.79
Camden †	54	−18	26.4	0.07
Campbell	54	−22	22.4	T.
Clear Lake †	53	−20	24.2	1.23
Clearwater *[1]	46	−12	25.4	0.87
Collegeville	50	−18	25.9	0.38
Crookston †	44	−22	16.9	0.60
Dawson *[1]	56	−24	22.6	T.
Farmington †	50	−15	25.4	1.47
Fergus Falls †	47	−22	22.4	0.18

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Minnesota—Cont'd.	°	°	°	*Ins.*
Fort Ripley †	.....	.....	.....	0.21
Grand Meadow †	55	—11	24.3	0.94
Granite Falls	54	—20	24.4	0.16
Hutchinson †	48	—16	23.6	1.10
L Winnibigoshish[e]	45	—23	20.1	0.71
Lawrence †	47	—17	23.1	1.50
Leech Lake [1]	47[e]	—30	18.3	0.89
Long Prairie †	45	—23	21.4	0.18
Luverne †	55	—16	25.5	0.56
Maple Plain	49	—17	25.6	1.44
Marfield †	46	—26	17.2	1.32
Maseppa [1]	50[e]	—10	25.1	1.00
Milan †	54	—22	23.0	0.02
Minneapolis *a* †	47	—15	25.7	1.36
Minneapolis *b* [1]	49[e]	—15	26.0	1.39
Minnesota City †	56	— 8	28.6	0.76
Montevideo †	54	—19	25.8	0.25
Morris †	52	—22	23.4	T.
New London	51	—22	21.0	0.01
New Ulm	54	—18	28.4	1.65
Ortonville †	.....	.....	.....	T.
Park Rapids †	41	—26	18.7	1.13
Pine River [1]	47	—19	22.5	1.11
Pleasant Mounds [1]	56	—15	25.6	0.27
Pokegama Falls [1]	47[e]	—28	17.4	1.28
Red Lake †	45	—25	20.0	0.20
Red Wing †	.....	.....	.....	0.95
Redwood Falls †	.....	.....	.....	0.24
Rolling Green †	47	—17	26.2	1.45
St. Charles †	52	— 9	27.9	0.95
St. Cloud	45	—17	25.2	0.69
St. Olaf	47[d]	—20[d]	22.2[d]	0.08
St Peter †	52	—12	27.0	1.53
Sandy Lake Dam [1]	48[e]	—25	21.4	0.89
Sauk Center	45	—24	20.7	2.00
Sunrise City [e]	46	—12	24.3	.....
Two Harbors †	54	—15	27.4	2.02
Wabasha [1]	52	— 8	27.8	0.93
Willmar †	49	—18	22.4	0.07
Winona	55	— 6	29.2	0.86
Worthington	51	—19	25.4	0.34
Mississippi.				
Agricultural Col'ge	75	10	47.8	4.11
Batesville †	73	8	44.2	4.11
Bay St. Louis †	75	18	55.2	2.16
Biloxi †	74	15	53.4	2.85
Briers	74	12	51.4	6.76
Brookhaven †	81	6	52.8	5.90
Canton †	76	14	49.8	5.38
Columbus †	.....	.....	.....	3.25
Corinth †	70	6	41.8	4.16
Crystal Springs †	78	12	49.6	5.39
Duck Hill †	75	6	46.3	3.45
Edwards	77	12	49.8	5.88
Enterprise † [e]	80	8	47.4	4.87
Fayette †	76	14	50.8	4.55
French Camps †	70	2	.....	4.04
Fulton †	72	8	46.4	2.90
Greenville *a*	74	11	48.4	4.24
Greenville *b* †	80	11	48.8	4.25
Hattiesburg †	77	13	52.0	4.78
Hernando †	74	8	44.0	3.87
Holly Springs †	71	4	44.6	4.31
Jackson †	77	9	48.9	3.71
Kosciusko †	77	9	48.1	3.40
Lake †	79	8	47.6	4.47
Leaf [1] [e]	70	13	43.9	.....
Leakesville †	80	12	53.6	6.15
Logtown †	78	13	54.2	3.40
Louisville †	79	3	47.6	4.33
Macon †	76	10	47.8	3.87
Mayersville [d]	77	22	52.1	3.45
Moss Point †	76	16	54.0	0.70
Natches †	80	13	53.8	4.28
Okolona †	74	8	47.6	2.45
Palo Alto †	76	9	47.8	2.62
Pontotoc †	79	2	48.3	5.17
Port Gibson †	77	12	50.2	4.46
Rosedale †	79	8	46.6	3.99
Stonington [1]	80	14	52.2	.....
Thornton [1] †	78	15	52.9	4.93
Topton [e]	76	18	50.1	4.60
University †	77[e]	12[e]	46.3[e]	4.23
Vaiden †	87	7	49.0	2.99
Water Valley [1]	76	8	46.2	4.69
Waynesboro *a* †	75	8	47.7	6.30
Woodville †	79	13	54.8	3.75
Yazoo City †	82	9	49.9	4.80
Missouri.				
Appleton City †	69	0	37.8	2.55
Arthur * † [e]	.....	1	33.2	3.24
Bagnell †	.....	.....	.....	3.70
Bethany	66	— 4	33.8	1.33
Birch Tree	69	— 1	38.9	2.24
Bluffton [1]	68	2	38.0	3.26
Boonville †	.....	.....	.....	2.07
Brunswick	67	— 2	36.4	0.72
Carrollton †	67	3	36.4	0.87
Carthage	.....	.....	.....	1.53
Conception	64[e]	— 4	33.0[d]	1.29
Cowgill [e]	68	0	36.9	0.65
Darksville †	67	0	36.6	0.70
Downing	.....	.....	.....	0.89
East Lynne [e]	.....	1	35.4	1.84
Edge Hill [e]	66	0	37.2	3.75
Eight Mile [e] [1]	61	— 1	36.4	1.57
Eldon [1]	70	2	37.1	3.43
Elmira	70	— 2	35.6	1.11
Emma [e]	.....	2	36.1	1.15
Fairport	.....	.....	.....	1.44
Farmersville	.....	.....	.....	1.15
Fayette	71	1	36.9	1.39
Fox Creek [e] [1]	64	0	37.2	3.22
Fulton	.....	.....	.....	1.06
Gallatin [e] [1]	66	— 3	34.3	1.45
Gayoso [e] [2]	.....	0	37.6	4.16
Glasgow	69	0	36.2	0.86
Glenated	.....	.....	.....	2.86
Gordonville [e] [3]	.....	0	37.0	5.79
Gorin [e] [3]	.....	6	33.2	0.58
Grove Dale	.....	.....	.....	3.82
Half Way	68	— 1	37.5	2.37
Harrisonville †	66	— 1	34.2	1.51
Hastain	63	1	37.5	3.97
Hermann †	.....	.....	.....	3.03
Houston	68	4	37.0	3.26
Houstonia (near)	.....	.....	.....	1.36
Humansville	70	— 2	37.4	2.43
Ironton * † [1]	65	0	36.7	4.55
Jefferson City †	69	3	40.4	2.84
Kidder	65	— 3	34.4	1.46
Lamar	68	2	39.0	2.00
Lamonte	.....	.....	.....	2.49
La Plata * [1]	66[d]	— 2	34.6	0.44
Lebanon	74	— 2	40.7	2.81
Liberty	67	1	36.4	1.46
Linn Creek	70	— 1	40.6	4.17
Louisiana Bridge †	.....	.....	.....	1.96
McCune * † [1]	65	— 1	35.4	1.31
Marble Hill	.....	— 2	.....	3.27
Marceline	.....	.....	.....	0.43
Marshall †	69	— 1	35.8	0.97
Maryville * [4]	64	— 4	29.8	0.90
Mexico †	69	0	34.8	1.05
Miami	68	2	35.0	1.05
Mine La Motte †	67	— 2	38.6	4.39
Mount Vernon	66	— 4	34.7	2.10
Nevada	.....	.....	.....	1.90
New Boston	58	2	31.4	T.
New Hartford * [1]	72	0	36.8	1.15
New Haven * [1]	62	3	35.9	1.12
New Madrid	68	2	42.4	4.18
New Palestine	.....	.....	.....	1.65
Oakfield †	63	— 1	37.6	2.78
Oak Ridge * [4]	.....	0	40.0	4.91
Olden †	70	— 1	41.6	2.66
Oregon *a*	67	— 3	35.6	1.25
Oregon *b*	65	— 3	34.6	0.98
Oto	.....	.....	.....	1.89
Palmyra	.....	.....	.....	1.21
Panacea	72	— 2	42.9	1.39
Pickering * [5]	68	— 6	32.0	1.40
Platte River * [3]	66	4	32.4	1.53
Poplar Bluff	68	— 4	39.4	3.92
Potosi	66	— 5	35.6	3.50
Princeton * [1]	67	— 4	33.3	1.05
St. Charles	64	— 1	36.2	2.04
St. Joseph †	.....	.....	.....	1.03
Sarcoxie * [3]	.....	— 4	37.0	2.18
Shelbina	.....	.....	.....	1.10
Steffenville	.....	.....	.....	0.51
Stellada †	71	— 3	38.8	2.60
Sublett	64	— 3	33.8	0.35
Tindall †	.....	.....	.....	0.48
Unionville †	73	— 7	32.4	0.50
Vera Cruz	.....	.....	.....	2.17
Vermont * † [1]	66	1	36.2	2.08
Vilas	.....	.....	.....	1.59
Virgil City	.....	.....	.....	3.37
Warrensburg * [1]	68	3	37.6	2.22
Warrenton	68	— 1	38.2	2.88
Wheatland	.....	.....	.....	3.66
Montana.				
Anaconda †	.....	.....	.....	0.19
Billings †	60	—15	27.0	0.60
Boulder †	48	—21	20.4	0.19
Bozeman †	58	0	23.3	0.60
Butte †	44	—12	21.4	0.22
Cascade †	.....	.....	.....	0.61
Choteau †	55	—12	28.0	0.35
Cokedale * † [4]	46	—11	22.8	1.50
Columbia Falls †	41	—17	23.4	1.21
Deer Lodge City †	50	—20	20.8	0.20
Fort Custer †	.....	—18	.....	0.40
Fort Keogh †	59	—26	23.8	0.25
Fort Logan †	54	—25	22.7	0.80
Fort Missoula	45	—21	20.5	1.06
Glasgow †	48	—18	18.2	0.50
Glendive †	45	—22	20.2	0.75
Great Falls †	54	—11	31.8	0.74
Hogan †	56	—10	27.8	1.10
Kipp †	54	—22	26.2	1.08
Martinsdale †	50	—16	24.8	0.58
Marysville †	46	— 8	24.4	0.66
Mingusville †	62	— 8	29.0	0.71
Pony †	.....	.....	.....	0.07
Radersburg †	.....	.....	.....	0.38
Troy †	.....	.....	.....	1.57
Utica †	55	—11	28.6	0.44
Virginia City †	46	— 5	21.6	0.58
White Sul. Springs †	49	—19	20.8	0.49
Nebraska.				
Agee * [1]	64	—20	26.5	T.
Alliance	.....	.....	.....	T.
Ansley †	65	—19	29.6	0.12
Arapahoe	.....	.....	.....	0.40
Arborville * [1]	60	— 9	32.4	1.01
Arcadia [b]	63	—12	32.8	0.10
Ashland *a* †	65	— 8	32.9	0.72
Ashland *b* * [1]	58	— 7	32.2	0.62
Auburn * † [1]	64	— 6	33.9	0.90
Aurora * [1]	62	— 8	30.2	0.12
Bassett	64	—17	29.2	T.
Beatrice †	64	— 6	32.3	0.90
Beaver City	65	— 7	30.0	0.60
Benkelman * [1]	75	—12	30.0	0.25
Blue Hill * [1]	68	—10	32.6	0.90
Bratton * [1]	62	— 6	33.0	0.71
Broken Bow * [1]	60	—12	29.4	.....
Burchard * [1]	70	—10	33.1	0.20
Burwell * [1]	.....	.....	.....	0.00
Callaway †	65	—11	30.5	0.00
Central City * [3]	60	— 6	31.1	0.86
Chadron * [1]	78	—16	30.6	0.11
Chester * [1]	65	— 8	30.7	0.65
Columbus †	62	—10	32.6	1.01
Cornlea	.....	.....	.....	1.01
Cortland * [1]	60	—10	30.4	0.62
Creighton † [1]	63[e]	—14	27.3	0.53
Crete	67	—11	33.5	0.67
Culbertson	.....	.....	.....	0.12
Custis *a* * † [5]	60	—11	32.2	0.02
Curtis *b* * [1]	70	—18	28.0	T.
David City * † [3]	55	—12	27.0	1.00
Dunning	62	—14	33.1	T.
Edgar * [1]	64	—10	32.1	0.64
Elwood	.....	.....	.....	0.43
Ericson * † [1]	65	—13	28.6	0.10
Ewing †	.....	.....	.....	0.11
Fairmont * [1]	64	— 9	30.9	0.68
Fontanelle	59	—10	29.9	1.25
Fort Robinson	64	—15	29.8	0.44
Franklin †	68	—15	29.4	0.61
Geneva †	66	— 8	33.1	1.11
Genoa †	60	—11	30.7	0.97
Gering †	67	—12	30.8	0.40
Gibbon [1]	61	—10	29.2	0.50
Glenwood * [3]	.....	—14	22.5	1.01
Gothenburg	62	—10	33.6	0.10
Grand Island * [1]	65	— 8	35.7	1.25
Greeley Center * [1]	64	0	28.1	0.50
Haigler * [1]	64	—10	29.3	0.02
Hartington †	69	—14	29.5	1.00
Harvard * [1]	66	— 8	30.0	0.80
Hastings * [1]	58	—13	27.1	1.16
Hayes Center	.....	.....	.....	0.20
Hay Springs †	61	—17	27.3	0.10
Hebron †	65	— 7	32.8	0.54
Hickman * [1]	72	— 8	33.6	0.53
Holdrege *a* * [3]	.....	—11	25.2	0.20
Holdrege *b* * [1]	64	— 8	29.3	0.45
Imperial *a* †	69[e]	—16[e]	28.1[e]	0.20
Imperial *b* * [1]	65	—12	27.0	0.07
Indianola * [5]	62	—10	28.9	0.60
Kearney * [1]	60	—10	32.2	0.70
Kennedy * † [1]	63	—16	31.0	T.
Kimball †	62	—16	27.0	0.55
Lexington †	65	—14	27.2	0.34
Lincoln	65	— 6	33.6	0.36
Lodge Pole †	62	—18	26.2	0.06
Loup City * [1]	62	—11	29.9	0.22
Lynch * † [1]	65	—13	27.6	T.
McCook * [1]	63	— 8	31.0	0.69
Madison	.....	.....	.....	0.73
Madrid * † [5]	63	—16	29.3	0.10
Marquette *	63	— 9	.....	1.08
Minden * [1]	65	—18	28.6	0.85
Mullen * †	64	—16	.....	.....
Nebraska City * † [1]	60	— 7	30.1	0.05
Norfolk †	58	—14	29.7	1.00
North Loup * † [1]	61	—12	28.6	0.28
Oakdale †	62	—13	29.2	0.87
Odell * [5]	63	— 7	35.1	0.67
Ogallala †	62	.....	.....	.....
Omaha * [1]	56	— 6	29.4	1.05
O'Neill * [1]	69	—16	29.0	T.
Ough †	.....	.....	.....	0.20
Palmer *a* [1]	62	—12	27.8	1.10
Palmer *b*	.....	.....	.....	1.33
Plattsmouth *a* †	.....	.....	.....	0.68
Plattsmouth *b* * [1]	66	— 5	34.4	0.68
Ravenna *a*	62	—10	31.3	0.51
Ravenna *b* * [1]	65	—11	30.9	0.50
Red Cloud *a*	.....	.....	.....	0.67
Red Cloud *b* * [1]	68	— 7	30.2	0.94
Republican * [1]	58	—10	31.4	0.30
Rulo * [1]	67	— 2	36.2	0.54
Salem * [1]	62	— 2	34.3	1.61
Santee Agency †	61	—14	29.7	0.06
Schuyler	.....	.....	.....	1.15
Seneca * [1]	55	—15	25.0	T.
Seward * [3]	65	— 7	36.1	0.90
Springview	64	—20	30.2	T.
Stanton * [1]	54	—12	27.4	1.10
State Farm	70	— 7	34.8	0.52
Strang * [5]	66	— 8	33.2	0.65
Superior * [5]	76	— 4	38.2	0.80
Sutton	65	— 8	32.0	0.76
Syracuse	.....	.....	.....	0.51
Tecumseh †	64	— 6	31.8	0.83
Tekamah	59	—12	27.1	1.20
Turlington †	72	— 9	33.0	0.72
Wakefield	.....	.....	.....	0.96
Wallace * [1]	62	—13	27.7	0.00
Weeping Water * [1]	77	— 7	29.2	0.51
West Point †	.....	.....	.....	0.02
Whitman [e]	60	—18	.....	T.
Wilber * [1]	74	— 7	34.1	0.63
Wilcox	.....	.....	.....	0.91
Wilsonville * [1]	60	— 8	30.1	0.47
York * [1]	54	— 7	31.1	0.19
Nevada.				
Austin	49	2	26.2	2.77
Battle Mountain * [1]	52	—10	28.2	1.15
Belmont	45	— 2	23.3	2.10
Beowawe * [3]	45	6	24.2	1.20
Carlin * [3]	50	—21	23.4	1.91
Carson City	51	5	29.3	3.23
Clover Valley †	.....	.....	.....	2.54
Cortez †	.....	.....	.....	3.10
Cranes Ranch	.....	.....	.....	1.57
Downeyville	56	0	35.4	0.67
Elko * [3]	40	—16	22.4	1.57
Elko (near)	61	—20	23.6	3.24
Ely	50	—12	22.6	3.15
Empire Ranch †	46	—17	15.4	0.59
Fenelon * [3]	50	— 4	34.2	.....
Genoa	56	3	28.8	3.00
Golconda * [1]	64	— 4	30.7	1.30
Gold Hill	53	10	31.1	3.11
Halleck * [1]	40	—22	19.0	2.02
Hawthorne *a* * [3]	51	6	32.2	0.46
Hawthorne *b*	55	12	33.2	0.44
Hot Springs * [1]	48	5	31.9	0.68
Humboldt * [3]	59	— 4	28.9	0.50
Lewers Ranch	52	8	31.1	5.28
Lovelock * [3]	50	8	34.3	0.10
Marlette Lake †	.....	.....	.....	8.77
Mill City * [1]	48	— 5	29.1	.....
Osceola	57	8	29.0	3.47
Palisade * [1]	56	—14	27.8	2.37
Palmetto	50	1	27.6	4.00
Paradise Valley	57	—10	26.3	2.38
Reno * [3]	66	10	36.8	2.65
Reno State Univ'ty.	47	6	30.0	1.88
Ruby Valley †	.....	.....	.....	1.54
St. Clair	56	8	30.5	1.19
Stoffel	47	—32	18.8	2.87
Sunnyside	53	—10	29.6	2.65
Tecoma * [3]	50	— 4	26.1	1.30
Toano * [1]	48	—18	18.9	3.45
Tybo	40	3	25.8	3.04
Verdi * [3]	50	5	27.0	5.70
Virginia City	.....	0	.....	2.71
Wadsworth * [3]	56	6	30.3	.....
Wells	40	—10	19.6	1.65
Winnemucca * [3]	55	— 9	25.5	2.00
Yerington	54	11	32.2	1.01
New Hampshire.				
Alstead * [5]	44	— 6	22.9	2.52
Belmont	.....	.....	.....	1.78
Berlin	45	—25	19.4	.....
Berlin Mills	47	—26	19.6	3.25
Bethlehem	46	—13	21.4	1.84
Brookline * [1]	52	— 4	26.3	2.69
Concord	53	—10	25.6	2.87
Dublin	48	— 5	24.8	3.50
Hanover	46	—18	23.1	2.45
Keene	50	—19	23.5	2.77
Lakeport	.....	.....	.....	2.11
Lancaster	42	—16	22.0	3.00
Littleton	46	—20	21.4	1.91
Mine Falls	.....	.....	.....	2.88
Nashua	52	— 4	25.4	3.44
Newton	50	0	26.3	2.38
North Conway	54	—11	21.9	3.60
Pennichuck Station	.....	.....	.....	3.07
Peterboro	53	—10	23.6	2.93
Plymouth	48	—14	19.9	1.88
Sanbornton †	48	— 6	23.0	1.83
Stratford	51	—24	23.9	1.70
Weirs Bridge	.....	.....	.....	1.75
West Milan	57	32	17.6	3.67
Wolfboro	.....	.....	.....	1.59
New Jersey.				
Allaire	61	5	35.2	.....
Asbury Park	57	8	36.3	5.82
Barnegat	62	5	36.0	3.56
Bayonne	54	7	34.8	5.06
Beach Haven	55	10	37.6	2.80
Belvidere	54	1	32.7	5.55
Beverly †	59	5	35.6	5.95
Billingsport [1]	56	7	33.6	4.27
Blairstown	50	5	32.2	.....
Bridgeton	61	10	38.5	4.33
Camden	56	8	35.0	4.99
Cape May	57	13	39.8	1.64
Cape May C. H †	57	8	38.2	1.97
Charlotteburg	55	4	31.2	4.23
Chester	56	0	30.1	4.38

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
New Jersey—Cont'd.	°	°	°	*Ins.*
Coleaville	51	— 1	30.8	3.78
Deckertown	51	— 1	30.7	5.55
Dover	55	2	31.8	4.06
Egg Harbor City	63	7	35.6	3.41
Elisabeth †	56	4	34.0	4.63
Franklin Furnace	52	6	31.0	3.71
Franklinville	62	6	34.0	5.18
Freehold	64	5	36.2	4.90
Friesburg				4.26
Gillette	59	4	32.3	3.73
Hammonton				3.57
Hanover	52	2	33.2	4.54
Hightstown	59	4	34.6	4.64
Imlaystown	55	5	35.9	3.86
Junction				3.77
Lambertville	52	6	34.7	4.39
Millville	62	8	37.8	3.08
Moorestown	60	5	35.6	5.88
Newark a		5	35.4	4.09
Newark b †	54	6	35.1	4.61
New Brunswick a	54	6	34.8	3.86
New Brunswick b	60	3	34.5	4.74
Newton	58	6	31.5	5.39
Ocean City	51	8	37.8	2.66
Oceanic	57	8	38.2	6.04
Papakating	59	0	31.2	3.86
Paterson	59	7	35.2	4.49
Pensauken				4.76
Perth Amboy	54	5	34.4	5.02
Plainfield	58	5	34.8	4.64
Rancocas *	57	5		5.25
Readington *[1]	56	8	38.8	
Ringoes				4.20
River Vale	56	— 3	33.0	3.59
Salem	57	8	35.0	3.96
Somerville	63	— 2	34.8	3.75
South Orange	54	2	33.6	4.98
Tenafly	56	4	32.0	4.77
Toms River	63	6	36.2	6.39
Trenton	55	1	37.4	4.52
Vineland	62	7	37.1	3.58
Whiting	66	8	38.8	4.15
Woodbine	63	7	36.3	2.53
New Mexico.				
Albert †	70	9	40.1	T.
Albuquerque †	59	11	36.5	0.31
Alma †	66	17	42.5	1.24
Bloomfield †	58	5	32.8	0.40
Chama †	63	— 7	31.4	3.20
Ciruelia				0.07
Deming *[2]	77	24	49.0	0.36
East Las Vegas †	65	3	35.0	0.28
Eddy †	80	18	45.2	0.20
Fort Bayard	68	18	42.2	0.80
Fort Stanton †	66	6	39.2	0.37
Fort Wingate	80	4	35.2	2.32
Fresnal	64	8	38.5	0.46
Galisteo †	56	11	34.2	0.53
Gallinas Spring †	67	5	37.8	0.20
Gila	69	24	46.3	1.53
Halls Peak †	70	15	44.7	0.23
Las Cruces †	64	20	48.5	0.73
Lordsburg *[2]	67	11	36.8	T.
Los Lunas †	59	— 6	36.4	0.10
Monero †				2.44
Pecos	63[1]	— 6	35.8[1]	1.87
Raton †	69	20	44.6	0.28
Rincon †	74	12	42.4	0.52
Roswell †	68	10	39.9	0.50
San Marcial †	72	— 2	36.2	0.14
Springer †				T.
New York.				
Addison	55	— 26	30.7	2.93
Akron				1.73
Alfred Center	56[4]	— 9[4]	29.7[4]	3.02
Angelica †	56	— 26	28.1	2.23
Arcade	55	— 8	28.5	1.65
Arkwright	54	4	30.8	
Atlanta				2.46
Baldwinsville	54	— 6	30.1	2.62
Bedford	58	0	33.2	3.86
Big Sandy *[10]	58	— 20	33.0	
Binghamton †	54	— 18	28.2	3.31
Boonville				0.93
Bovina Center				3.10
Brookfield	51	— 7	27.2	1.90
Brooklyn	53	6	35.2	5.20
Canton †	59	— 37	24.0	2.35
Charlotte *[10]	58	4	33.0	
Cherry Creek				2.72
Cooperstown †	54	— 6	27.3	2.33
Cortland	49	— 3	27.3	1.70
De Kalb Junction				1.90
Demster				2.48
Deposit				2.35
Easton	60	— 10	29.6	1.99
Eden	57	— 9	33.0	5.60
Elmira †	55	— 2	31.3	2.89
Fleming	57	3	33.8	2.87
Fort Niagara †	57	— 23	34.4[1]	2.09
Friendship	45	— 14	25.1	2.15
Glens Falls	47	— 17	24.7	3.78
Gloversville	52	— 19	26.5	3.04
Hamilton	59		33.0	1.18
Hess Road St'n †				2.35

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
New York—Cont'd.	°	°	°	*Ins.*
Honeymead Brook	52	— 7	27.9	4.63
Humphrey †	55	— 3	30.4	1.89
Hyndsville	55	— 5	27.2	
Ithaca	56	— 1	31.2	2.39
Jamestown *[6]	52	— 1	30.9	
Kings Station				3.06
Lebanon Springs	49	— 10	26.7	3.30
Le Roy	55	— 6	30.1	3.34
Lockport	58	— 2	31.5	2.13
Lowville	51	— 27	26.0	2.70
Madison Barracks †	61	— 23	29.8	2.27
Malone	53	— 18	22.7	3.13
Marlboro	67	— 5	32.3	4.48
Middletown	51	2	30.4	2.46
Minnewaska	48	0	27.2	5.05
Mount Morris	63	— 14	32.0	
Newark Valley				2.09
New Lisbon	54	— 17	26.1	1.92
North Hammond †	56	— 22	27.3	
Number Four †	50	— 22	22.6	3.10
Ogdensburg	57	— 24	27.2	
Oneonta	56	— 6	30.6	4.33
Oxford	53	— 18	27.2	2.60
Palermo †	51	— 8	28.9	2.27
Perry City	56	— 13	28.3	3.06
Phœnix				3.49
Pine City				2.40
Plattsburg B'ks	51	— 22	24.2	2.55
Port Jervis	48	0	29.6	6.05
Potsdam [1]	60*	— 22	26.8	2.55
Poughkeepsie	55	— 14	29.2	4.12
Rome	50	— 15	26.9	2.75
Romulus	56	— 1	32.2	2.73
Saranac Lake	52	— 32	21.0	2.27
Setauket †	58	9	35.3	4.60
Skaneateles				2.16
South Canisteo	59	— 16	30.3	3.41
South Kortright †	55	— 12	25.0	3.08
Stillwater	49	— 20	25.2	2.71
Turin	46	— 14	24.3	3.24
Varysburg	61	— 16	30.2	2.06
Wappingers Falls	53	— 11	28.9	4.61
Warwick				4.40
Watertown	60	— 20	27.8	2.53
Waverly †	58	— 24	30.4	2.56
Wedgwood	57	— 8	29.8	3.15
West Chazy	47*	— 24*	24.0*	3.69
West Point †				2.92
Willets Point	56	6	34.3	5.19
North Carolina.				
Asheville †	62	— 3	37.8	4.10
Bailey *[5]	68	0	42.3	4.04
Bakersville †	65	— 4	37.8	4.58
Blowing Rock †	62	— 8	37.4	5.25
Bryson †				5.93
Chapel Hill †	70	8	41.9	2.33
Currituck Inlet †				2.60
Experiment'l Farm	70	9	43.5	2.50
Fair Bluff †				1.56
Falkland *[1]	70	10	44.2	2.01
Fayetteville †				1.84
Flat Rock	66	— 4	39.2	9.96
Greensboro †				2.41
Greenville		8	41.4	1.43
Henderson †	73	— 10	36.9	3.10
Highlands	60	— 5	41.1	8.82
Horse Cove †	64	— 1	38.7	8.35
Lenoir *† [1]	64	10	41.0	6.21
Littleton †	70	10	40.8[2]	2.43
Louisburg †	72	13	49.0	2.84
Lumberton †	74		38.5	2.20
Lynn *† [2]	70	— 5	40.4	8.86
Marion	68	6	44.4	6.86
Mocksville †	69	7	41.8	4.32
Moncure †	71	8	40.5	2.69
Morganton *† [1]	70	5	39.2	4.75
Mount Airy †	64	6	43.2	3.85
Mount Pleasant	71			4.40
Murphy †		14	47.8	7.31
Newbern †	76	7	40.6	1.50
Oak Ridge †	67			3.25
Pantego		7	41.6	1.02
Pittsboro	70	10	45.5	3.54
Raleigh *† [1]	70	9	47.2	
Rockingham †	77			2.95
Roxboro †	68	13	45.1	2.69
Salisbury a	66	4	39.1	3.87
Saxon †	73	10	44.4	3.20
Selma	68	1	42.2	1.80
Shelby †	68	0	41.0	6.50
Skyuka	75	17	47.9	8.09
Sloan †	70	5	42.4	1.42
Soapstone M't †	82	5	46.5	3.22
Southern Pines †	71	14	49.4	2.40
Southport †	73	11	45.0	0.72
Tarboro	61	— 4	39.2	2.39
Waynesville †	70	12	42.3	5.29
Weldon †	71	11	43.4	2.72
Willeyton				2.38
North Dakota.				
Ashley †	52	— 24	22.0	T.
Berlin †	55	— 24	20.1	0.27
Bottineau †	41	— 26	14.8	0.12
Churchs Ferry	41	— 23	15.5	1.28
Dickinson †	51	— 22	20.2	T.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
N. Dakota—Cont'd.	°	°	°	*Ins.*
Ellendale	56	— 19	22.9	0.02
Fargo †	46	— 24	19.4	0.00
Forman †	52	— 18	21.0	0.19
Fort Berthold	52	— 24	23.9	0.03
Fort Yates †	55	— 15	22.8	T.
Gallatin †	50	— 25	18.6	0.29
Grafton †	39	— 20	14.9	0.30
Jamestown †	52	— 17	24.3	1.20
Kelso †	44	— 24	16.3	0.20
Lakota †	43	— 25	16.5	0.38
Larimore † [3]	55	— 25	23.6	
Lemert †	49	— 25	19.2	0.16
McKinney	41	— 23	16.3	0.02
Milton †	40	— 27	13.0	0.40
Minto †	41°	— 21°	16.9°	0.36
Napoleon †	70	— 25	22.4	0.30
New England City †	70	— 22	23.5	0.20
Oakdale †	53	— 14	23.3	0.40
Portal †	39	— 28	14.6	0.08
Powell †	49	— 21	20.8	0.58
St. John †	44	— 19	17.6	0.50
Sheyenne	44	— 24	17.6	0.11
Steele †	63	— 26	20.4	0.04
University †	46	— 20	20.2	0.60
Valley City †	48	— 30	21.2	0.33
Wahpeton †	52	— 20	24.1	0.40
Washburn [1]	56	— 22	19.8	T.
White Earth *[1]	42	— 24	15.0	0.35
Wild Rice † [2]			18.2	0.73
Willow City †	42	— 33	12.8	
Woodbridge †	39	— 32	13.3	0.48
Ohio.				
Akron	54	— 4	33.3	2.68
Annapolis	54	— 9	32.1	3.62
Arcanum				2.46
Ashland	57	— 8	31.3	2.35
Athens	61*	— 12*	38.0[6]	3.65
Atwater				2.67
Auburn	54	— 6	30.7	3.25
Bangorville	61	— 11	31.1	3.00
Bellefontaine	62	2	34.9	2.26
Bement [1]	55*	— 4	30.0	3.36
Benton Ridge	64	— 6	34.1	1.94
Bethany	62	— 5	35.1	3.77
Big Prairie	57	— 7	33.0	2.09
Binola	57	— 2	34.5	2.54
Bissells	54	— 6	31.2	2.53
Bladensburg	58	— 9	31.7	3.09
Bloomingburg	63	— 5	35.6	2.72
Bloomington				3.17
Bowling Green	60	— 11	33.0	2.08
Bucyrus	66	— 12	33.7	2.50
Caledonia †				2.19
Cambridge	58	— 12	32.5	4.54
Camp Dennison	63	— 9	35.8	3.47
Canal Dover	60	— 10	33.1	2.45
Canton †	61	— 8	33.9	2.68
Cardington	58	— 10	31.8	1.92
Carrollton	55	— 13	32.0	2.49
Cedarville				3.72
Celina	70	4	40.8	1.68
Cherry Fork	62	1	34.8	3.78
Circleville a †				3.63
Circleville b	61	— 5	35.5	3.60
Clarksville	64	— 6	39.8	3.26
Cleveland	56	0	35.4	2.53
Clifton	63	— 6	33.3	3.55
Coalton	61	— 27	33.7	3.75
Colebrook				2.14
Cynthiana	62	— 4	36.1	3.23
Dayton a	65[1]	— 4[1]	34.2[1]	3.07
Dayton b †				3.19
Defiance	60	— 1	33.1	1.79
Demos	56	— 10	33.9	4.31
Dupont	60	— 5	32.4	2.14
Ellsworth	54	— 6	31.6	2.29
Elyria	57	— 2	33.1	2.53
Fairport Harbor [10]	58	— 2	35.0	
Fayetteville	61	— 6	35.3	4.00
Findlay	59	— 8	33.5	1.78
Fostoria	52	— 5	33.9	1.50
Frankfort	56	— 3	34.4	3.78
Garrettsville	56	— 4	31.1	3.37
Georgetown	63	— 5	36.3	3.32
Granville	57	— 9	32.9	3.96
Gratiot	56	— 5	33.8	4.59
Green Hill	54	— 18	30.7	2.34
Greenville	57	— 2	34.1	2.89
Guysville	61	— 14	33.7	4.16
Hackney	63	— 10	33.9	3.92
Hanging Rock	57	— 8	36.7	3.59
Harbor	60	— 1	33.9	2.28
Hebbardsville	60	— 8	37.2	3.02
Hedges	56	— 5	31.7	2.23
Hillhouse	65	— 4	32.0	3.75
Hillsboro	54	— 8	34.7	2.68
Hiram	62	— 8	31.0	3.72
Jacksonboro		— 5	35.6	2.45
Kenton †	59	— 4	34.8	2.44
Kilbourne	60	— 19	33.2	1.76
Killbuck	55	— 7	32.4	2.26
Levering	60	— 19	30.5	2.58
Logan	60	— 10	34.8	3.57
Lordstown	59	— 7	31.5	2.43
Lowell	67	— 20	32.7	1.92

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Ohio—Cont'd.	°	°	°	*Ins.*
McArthur	69	— 10	34.2	4.34
McConnelsville	58	— 7	34.6	3.98
Mansfield †				3.06
Marietta a †				4.97
Marietta b	60	— 4	36.0	4.09
Marion	60	— 5	34.3	2.42
Milfordton	58	— 9	31.7	3.06
Milligan	58	— 18	33.1	3.89
Millport	55	— 5	31.4	2.20
Montpelier	56	— 2	32.2	1.30
Napoleon	58	— 1	33.4	2.15
New Alexandria	68	— 6	33.9	5.99
New Berlin	54	— 10	31.6	2.14
New Bremen	60	— 9	33.8	2.42
New Comerstown	57	— 19	32.5	3.54
New Holland	62	— 5	34.1	4.27
New Waterford	67	— 25	32.2	3.49
North Lewisburg	60	— 6	34.3	3.40
North Royalton	55	— 6	32.3	2.72
Northwood	59	— 5	35.6	2.33
Norwalk	60	— 8	32.7	2.35
Oberlin		— 5		1.44
O. S. University	60	— 3	34.2	3.30
Orangeville	54[7]	— 14[b]	32.8[6]	1.80[6]
Ottawa	60	1	34.2	2.15
Pataskala	58	— 6	32.8	4.63
Peoli	57	— 10	30.8	3.60
Plattsburg	60	— 5	34.1	2.69
Pt. Marblehead *[10]	57	8	30.1	
Pomeroy	61	— 12	35.3	2.01
Portsmouth a †				3.92
Portsmouth b	64	1	38.3	4.11
Richwood				2.37
Ridge				4.34
Ridg'v'le Corners	56	— 2	33.4	1.18
Ripley	62	— 6	30.4	3.95
Rittman	55	— 10	31.0	2.43
Rocky Ridge	62	— 7	34.8	2.32
Rosewood	62	— 5	33.3	2.54
Sharon Center				1.95
Shenandoah	58	— 9	32.5	2.51
Sidney a †				3.11
Sidney b	60	0	33.3	2.38
Springboro				3.23
Steuben				1.98
Stoutsville				3.29
Swanton	63	1	34.2	2.01
Sylvania	56	— 5	31.5	1.94
Thurman	63	— 5	35.8	3.54
Tiffin †	58	— 3	35.1	2.00
Upper Sandusky	65	— 5	34.8	2.06
Vanceburg	64	— 4	36.8	3.65
Van Wert	60	— 1	33.4	2.19
Vermillion	59	— 3	33.4	2.43
Vickery	62	— 4	34.6	2.11
Walnut				4.01
Warren	57	— 10	32.7	2.58
Warsaw	56	— 15	31.8	4.46
Wauseon	58	— 5	33.3	2.17
Waverly	62	— 6	35.8	3.46
Waynesville				4.16
Wellington	57	— 5	35.1	2.16
Westerville	59	— 4	34.6	2.80
Weymouth	57	— 8	32.4	2.09
Wheeler †				1.77
Willoughby				2.16
Wooster a	57	— 7	32.9	3.15
Youngstown	54	— 8	32.0	3.12
Zanesville †				3.82
Oklahoma.				
Alva †	75	— 8	38.8	0.20
Anadarko †	75	2	43.2	0.86
Arapaho †	73	— 6	39.0	0.38
Burnett †	76	1	44.0	2.07
Clifton †	71	— 2	40.9	1.23
Fort Reno †	75	1	39.7	0.10
Fort Sill	79	3	42.8	0.65
Guthrie †	73	— 1	43.1	0.44
Mangum †	82	3	45.8	0.18
Norman †	69	0	39.3	2.19
Ponca †	74	— 8	40.0	1.02
Pond Creek †	76	— 8	37.4	0.30
Sac and Fox Ag'y †	85	— 3	43.4	1.00
Stillwater †	73	— 2	37.8	0.80
Winnview †	72	— 5	40.6	0.53
Oregon.				
Albany a †	52	27	39.2	5.52
Albany b *[6]	58	22	39.4	4.71
Arlington †	50	13	33.0	0.90
Ashland a *[8]	51	20	37.8	4.52
Ashland b	53	20	36.8	3.54
Aurora *[6]	60	30	41.9	4.27
Aurora (near)	55	24	39.1	4.73
Bandon	54	31	44.8	16.13
Bay City †	54	31	42.3	5.71
Brownsville *[6]	56	22	38.0	5.79
Burns †	61	5	33.6	1.42
Canyon City †	50	20	37.9	7.04
Comstock *[8]	50	24	37.2	7.49
Cornelius	55	27	38.8	5.35
Corvallis a	50	26	37.6	3.85
Corvallis b *[6]	51	27	38.6	6.06
Corvallis (near)	46	— 3	28.0	0.78
Crook	45	14	34.1	8.12
Detroit †				

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Oregon—Cont'd.	°	°	°	*Ins.*
Eugene †	59	22	38.8	6.42
Forest Grove	50	23	36.7	7.07
Gardiner	54	31	41.8	9.54
Glenora	47	20	33.0	14.44
Grants Pass *a* †	54	17	37.0	6.84
Grants Pass *b* *§	50	24	36.2	6.12
Happy Valley †	57	— 3	25.7	0.87
Heppner †	57	5	33.5	0.54
Hood River (near)	48	18	32.7	4.13
Hubbard	54	25	37.8	4.83
Jacksonville	55	20	35.7	5.07
Joseph †	42	— 6	21.2	1.80
Junction City *§	58	22	39.7	3.83
Lafayette *§	58	26	40.4	8.38
La Grande †	50	2	31.2	0.65
Lakeview †				3.45
Langlois	60	27	44.8	17.15
Lone Rock	54	— 6	26.8	1.09
McMinnville *a* †	53	24	38.0	5.57
McMinnville *b* *§	48	26	37.5	5.49
Merlin *§	54	18	34.4	8.49
Monmouth *§	49	30	40.6	4.73
Mount Angel †	56	20	38.9	4.16
Nehalem				9.54
Newport	73	30	45.7	6.16
Pendleton	56	11	35.1	0.62
Portland *§	50	28	38.6	5.52
Riddles *§	50	20	35.7	6.00
Roseburg *§	58	24	40.1	7.54
Salem *a* *§	60	33	46.2	5.12
Salem *b* †	55	25	39.2	4.62
Sheridan *§	52	27	39.2	6.54
Silverton *§	52	24	37.5	5.54
Siskiyou *§	45	18	33.6	8.45
Sparta	48	— 7	25.9	2.75
Springbrook	52	26	38.6	5.01
Springfield *§	49	18	35.4	5.96
The Dalles †	51	18	35.4	1.65
Vale	47	— 3	26.0	1.42
West Fork *§	54	22	38.5	9.64
Williams	56	17	36.2	8.60
Pennsylvania.				
Altoona	60	12	41.1	2.36
Aqueduct	56	1	34.3	3.79
Beaver Dam †				4.02
Bethlehem	52	3	33.1	4.85
Blooming Grove *[1]	50	— 8	28.3	4.15
Brookville †				4.48
Browers Lock				3.42
Carlisle *a*	50	— 2	31.8	3.38
Cassandra	60	— 8	31.9	4.04
Chambersburg †	61	— 3	32.3	2.65
Clarion †				3.94
Coatesville	59	3	33.5	4.70
Confluence †				5.93
Coopersburg	55	3	34.1	5.04
Davis Island Dam †				3.80
Doylestown				3.89
Drifton	52[f]	— 4[f]	29.8[f]	1.28
Du Bois †				3.22
Dyberry †	50	—11	26.8	3.89
East Manch Chunk	57	1	31.6	4.05
Easton	48	— 2	31.7	3.55
Edinboro *[1]	49	3	29.4	.....
Elwood Junction †				2.75
Emporium	59	—18	30.4	2.93
F'ks of Nesham'y[1]			38.2	4.62
Frederick				5.04
Freeport †				3.98
Girardville				4.75
Grampian	60	—10	28.8	3.85
Greensboro †				3.67
Greenville	54	— 8	32.2	2.27
Hamburg	52	1	32.9	3.61
Hollidaysburg	60	— 3	31.8	4.13
Honesdale	52	— 8	29.7	4.05
Huntingdon †	61	— 2	32.6	4.21
Johnstown †	64	— 2	34.0	4.24
Kennett Square	56	4	35.0	4.34
Kilmer *§	55	4	34.3	3.96
Lancaster [h]	58	23	38.4	3.33
Lansdale				3.92
Lebanon	54	1	32.8	4.17
Le Roy †	53	— 8	28.6	3.39
Lewisburg	59	—14	31.8	4.06
Lock Haven † [i]	55	—12[g]	30.8	3.73
Lock No. 4 †				3.56
Lycippus	66	— 3	34.3	5.15
Mahoning †				4.53
Oil City †				2.65
Ottsville				4.78
Parker †				3.54
Philadelphia *a*				4.68
Philadelphia *b*	58	7	36.9	4.44
Phœnixville	59	2	34.5	4.17
Point Pleasant				4.14
Pottstown	56	4	34.3	5.32
Quakertown *a*	52	2	32.1	5.33
Reading [g]			31.9	4.00
Ridgway †				3.23
Saegerstown	54	—15	31.4	2.39
Salem Corners	55	— 8	29.4	4.61
Saltsburg †				4.47
Seisholtzville				4.58
Selinsgrove	52	—10	24.7	3.76

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Pennsylvania—Con.	°	°	°	*Ins.*
Shinglehouse	59	—25	28.5	3.21
Smethport	62	—10	29.0	3.45
Smiths Corners				4.06
Somerset	63	—13	29.6	5.69
South Bethlehem	50	3	32.6	.....
South Eaton	53	— 5	30.4	3.41
State College	56	— 4	31.4	3.14
Stoystown †				4.57
Towanda	59	—16	30.4	3.07
Uniontown	58	— 5	36.6	5.19
Warren †				2.87
Wellsboro *† [1]	58	—28	27.8	4.07
West Chester	55	4	34.2	4.23
West Newton †				4.87
Westtown	53	5	33.0	4.36
Wilkesbarre †	53	— 5	32.2	3.66
York †	56	— 1	33.2	3.90
Rhode Island.				
Bristol	52	9	32.5	5.21
Kingston	55	6	31.4	5.66
Lonsdale				5.27
Pawtucket	58	11	31.6	5.34
Providence *a*	54	7	32.4	5.62
Providence *c*	56	5	31.0	5.42
South Carolina.				
Anderson †				5.37
Blackville †	74	9	50.0	2.22
Blenheim *§		11[b]	43.1[b]	2.10
Branchville	78	8	51.2	1.45
Camden †				2.56
Central [k]			42.6	6.37
Cheraw *a* †	72	8	45.9	2.33
Cheraw *b* †				2.36
Conway †				1.44
Cross Hill *[1]	70	10	47.3	4.31
Darlington *[1] [b]	74	13	47.8	.....
Effingham †				2.05
Flint Hill †	69	— 1	44.3	3.20
Georgetown †	77	10	49.2	1.03
Greenwood †				5.09
Hardeeville †	78	13	52.0	0.43
Holland †	74	7	46.2	5.40
Kingstree *a* †	79	15	52.2	1.75
Kingstree *b* †				2.59
Little Mountain	78	4	50.0	2.66
Longshore †	69	5	44.2	3.51
Mount Carmel †				4.39
Pinopolis *[1]	73	10	48.9	0.65
Port Royal †	75	13	53.2	0.48
St. Georges †	78	12	51.0	1.00
St. Stephens †				1.50
Santuck *[1]	66	1	44.6	5.32
Shaws Fork *[1]	80	17	50.6	2.25
Society Hill †	73	9	47.3	2.49
Statesburg †	75	6	48.7	2.90
Timmonsville *[1]	68	23	50.9	.....
Trenton	72	8	50.6	3.37
Trial †	85	11	53.1	1.75
Watts *§	70	8	46.5	4.74
Yorkville	71	5	46.8	5.45
South Dakota.				
Aberdeen †	58	—19	30.8	T.
Alexandria †	60	—19	25.9	T.
Ashcroft †	65	—30	24.8	0.15
Bowdle *† [1]	56	—20	27.4	0.05
Brookings †	53	—18	25.6	0.14
Castlewood †	53	—20	23.4	T.
Clark †	56	—21	26.1	T.
Cross †	64	—21	28.8	T.
Farmingdale				T.
Faulkton † *	56	—24	25.7	T.
Flandreau †	53	—18	26.4	0.35
Forestburg †	59	—20	26.4	0.05
Forest City † *	61	—16	24.7	T.
Fort Meade	70	—17	31.0	0.72
Gary †	54	—26	21.4	0.02
Greenwood	64	—12	30.0	0.05
Highmore †	59	—18	25.2	T.
Hotch City †	63	—22	26.2	0.12
Hot Springs †	65	—13	.....	T.
Howard †	56	—19	25.6	T.
Ipswich	56	—16	21.4	T.
Kimball †	62	—19	28.1	0.16
Millbank †	55	—18	24.0	T.
Northville *[1]	59	—21	21.2	T.
Oelrichs †	60	—20	25.8	0.20
Parker †	57	—17	25.8	1.00
Parkston †	62	—19	26.3	T.
Piedmont				0.18
Plankinton †	62	—17	27.6	0.05
Rochford				0.77
Rosebud †	66	—19	29.8	0.10
Shiloh †	60	—23	24.2	0.10
Silver City				0.21
Sioux Falls †	54	—17	25.6	0.45
Spearfish †	68	—13	32.4	0.82
Tyndall †	65	—14	31.8	T.
Vermillion	55	—14	29.0	1.04
Watertown †	52	—20	24.9	T.
Webster †	63	—24	27.2	0.12
Wessington †				0.00
Wessington Sp'gs †	60	—16	29.5	T.
Yankton †	61	—13	30.7	0.51
Tennessee.				
Andersonville *[1]	68	2	38.7	.....

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Tennessee—Cont'd.	°	°	°	*Ins.*
Ashwood *† [1]	65	4	42.8	3.16
Bristol †	51	—11	37.8	3.70
Byrdstown *† [1]	66	2	39.2	5.80
Carthage †				4.75
Charleston †				6.78
Clarksville	71	0	40.5	3.05
Clinton †				7.52
Columbia †				4.11
Covington *a* †	69°	4	43.1	3.60
Florence Station †	69	2	40.8	4.62
Franklin †	70	0	40.9	4.29
Greeneville †	62	— 4	40.9	3.70
Harriman †	65	0	40.4	6.07
Hohenwald *† [3]		1	36.6	5.27
Jacksboro *[4]		2	38.0	6.80
Jackson *† [1]	66	3	41.0	.....
Johnsonville †				3.23
Kingston †				5.52
Loudon †				6.72
Lynnville *[1]	75	6	41.8	5.87
McMinnville †				4.26
Newport *§	68	— 2	36.8	4.56
Nunnelly *[1]	71	3	42.2	4.61
Palmetto †				4.70
Parksville *[1]	66	3	43.6	6.85
Riddleton †	72	— 3	40.8	3.60
Rockwood †				6.93
Rogersville *[1]	64	3	39.6	5.51
Rugby *[1]	65	3	38.4	4.12
St. Bethlehem	68	1	41.4	3.18
Springdale *[1]	68	— 2	41.6	5.00
Strawberry Plains †				7.97
Tullahoma *† [1]	68	— 3	40.9	7.30
Waynesboro *[1]	70	5	41.4	3.65
Texas.				
Albany *† [1]	78	8	48.2	0.49
Alice † [j]	89	20	61.2	2.00
Arthur City †				1.60
Aurora *[1]	84	8	48.8	1.53
Austin *a* †	78	19	50.8	0.00
Austin *b* *§	82	16	56.8	.....
Bellville *§	80	16	62.4	0.25
Boerne *† §	75	15	50.2	0.23
Brady †	78	10	50.1	0.18
Brazoria †	83	19	59.0	2.23
Brenham †	80	15°	57.4	0.82
Burnet *† [1]	84	16	57.2	0.67
Camp Eagle Pass †	88	21	56.1	0.00
Coldwater †	69°	— 5°	34.2°	0.85
Coleman				0.40
College Station	79	6	54.4	0.26
Columbia †	80	18	58.2	0.87
Corsicana *b* †	78	8	49.7	0.99
Cuero † [j]	82	20	61.0	0.07
Dallas †	80	4	48.1	1.19
Durham †				0.01
Duval *[1]	83	14	56.9	T.
Estelle †	78	8	49.2	0.97
Flower Bluff †	80	23	63.3	0.00
Forestburg †	78	6	48.8	0.70
Fort Brown †	85	27	64.2	0.11
Fort Clark	85	21	56.8	0.20
Fort Hancock	79	16	45.9	0.36
Fort McIntosh	89	21	61.4	0.00
Fort Ringgold †	87	22	63.0	0.00
Fort Stockton †				0.27
Fort Worth † [b]	75	8	48.8	1.02
Fredericksburg *† [1]	79°	16	50.2°	0.19
Golindo				0.50
Graham †	83	2	48.7	0.66
Grape Vine †	79	6	48.8	1.54
Hale Center †	75	12	46.5	0.50
Hallettsville †	83	15	56.6	0.79
Happy	74	— 3	38.8	0.20
Hartley †	59	—10	29.5	0.80
Hewitt				0.60
Houston †	76	15	54.6	1.05
Huntsville †	78	12	55.8	3.11
Kent				0.31
Lampasas *[1]	80	10	50.8	2.24
Leakey †	85	22	56.2	0.00
Llano *† [2]	80	14	52.1	1.40
Longview †	77	10	51.1	3.66
Luling †	82	17	56.4	0.07
Marshall †	75	7	50.6	2.60
Menardville *† [1]	79	13	48.7	0.00
Midland †	97	14	48.8	0.30
Mountain Spring †	80	6	51.3	1.00
New Braunfels †	79	15	54.4	0.00
Orange †	78	15	55.8	0.60
Paris †	79	5	49.1	0.48
Roby †	77	5	47.2	0.91
Rockport *[1]	76	26	60.6	.....
Rock Springs †	90	14	54.0	T.
Round Rock †	84	14	58.2	0.33
San Antonio	81	19	55.8	0.02
San Marcos *a* †				0.09
Sierra Blanca †	88	20	53.8	0.00
Silver Falls †	76	1	44.7	T.
Sulphur Springs †	83	5	47.2	3.95
Temple †	84	9	51.3	1.22
Tyler †	78	7	50.2	1.64
Victoria *† [1]	80	22[c]	60.7[k]	T.
Waco †	85	10	53.0	0.15
Weatherford †	80	6	48.6	0.99

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Texas—Cont'd.	°	°	°	*Ins.*
Wichita Falls †	85	2	47.5	1.28
Utah.				
Alpine City †				2.92
Blue Creek *§	38	5	25.0	1.00
Castle Gate †				1.70
Cisco †	65	10	35.2	0.91
Coalville †	50	—16	19.8	1.45
Corinne *§	48	0	26.9	1.34
Deseret †				0.88
Emery				3.70
Fillmore †	62	— 6	28.4	1.77
Fort Du Chesne †	61	—15	24.8	0.69
Glendale *† [1]	58[c]	10	30.4[c]	.....
Green River †	40	8	21.8	0.50
Grouse Creek *† [1]	42	— 6	19.6	1.31
Grover *† [1]	44	— 2	24.0	0.37
Heber †	48	—14	20.9	2.60
Huntsville †				3.18
Kelton *§	48	2	35.2	0.80
Koosharem	45	—17	22.8	0.72
Lake Station *[1]	45	3	25.5	.....
Levan † [2]			26.8	2.75
Loa †	46	— 9	22.2	0.79
Logan †	47	—12	22.2	2.13
Manti †	60	— 5	30.0	1.60
Millville †				4.18
Moab †	57	10	34.7	1.23
Mount Pleasant *† [1]	58	5	29.4	1.86
Ogden *a* *§	45	14	30.8	2.30
Ogden *b* *† [1]	55	9	31.5	1.86
Parowan †	58	2	28.6	1.88
Promontory *§	53	2	28.9	1.77
Provo City † [2]			26.5	1.70
St. George †	64	13	39.4	1.90
Scipio †				2.00
Snowville †	46	— 3	22.6	2.55
Soldier Summit †	44	—16	17.4	4.10
Terrace *§	47	8	24.8	0.96
Thistle †	65	0	24.8	3.53
Vernal †	54	2	27.8	1.16
Vermont.				
Brattleboro	49	—13	25.3	3.00
Burlington †	49	—10	27.3	2.02
Cornwall	53	—13	25.5	2.68
Enosburg Falls †	50	—22	23.8	1.91
Hartland †	47	—22	21.4	2.88
Irasburg †	44	—20	18.2	4.52
Jacksonville	46	—16	23.4	4.49
Norwich *§	47°	—16	22.5	2.71
St. Johnsbury	42	—23	21.7	2.45
Simonsville	45	.....	23.2	2.20
Strafford *† [1]	42	— 9	22.4	3.00
Vernon *§	45	—11	23.0	3.04
Wells	51	—12	26.0	1.91
Woodstock	48	—28	21.6	2.13
Virginia.				
Abingdon †				3.41
Alexandria	59	5	37.0	2.72
Ashland †	66	5	40.4	2.44
Avon †	66	5	39.3	2.84
Bedford City †	61	5	40.6	2.47
Big Stone Gap †	60	— 5	35.4	4.87
Birdsnest *† [1]	70	14	42.5	2.03
Blacksburg	62	— 3	35.4	2.81
Buchanan †				2.84
Buckingham †	64	5	40.0	2.87
Callaville †	77	9	40.9	2.65
Cape Charles † [d]		16	43.1	2.44
Christiansburg †				3.05
Dale Enterprise †	64	— 8	35.0	2.45
Grahams Forge	62[e]	— 4[e]	36.7[e]	2.60
Hampton	69	12	43.5	2.06
Hot Springs	60	— 9	33.6	3.15
Irwin †	63	6	39.0	1.80
Lexington †	66	— 3	38.4	2.36
Marion †	59[d]	— 5[d]	37.1[d]	2.80
Monterey †	62	.....	.....	2.97
Nottoway	72	2	41.2	2.21
Petersburg †	70	10	42.4	2.66
Richmond (near) †	73	7	43.6	2.80
Richmond *b* †				2.81
Rocky Mount †	66	5	42.9	3.40
Salem †	69	4	43.0	3.00
Saltville	62	— 4	37.9	.....
Smithville †	66	6	39.8	1.52
Spottsville †	69	10	40.4	2.02
Stanardsville †	63	5	38.5	3.02
Staunton †	66	— 3	38.0	2.48
Stephens City †	60	1	35.3	2.95
Sunbeam †	70	10	42.1	2.20
Warsaw †	66	7	39.8	1.61
Whittles Depot †	74	3	40.2	3.83
Wytheville †	59	— 5	35.4	2.03
Washington.				
Aberdeen †	48	25	37.8	8.36
Anacortes				2.94
Blaine †	48	10	32.2	3.88
Bridgeport †	46	1	26.0	2.00
Cascade Tunnel †	45	0	25.2	5.24
Centerville †	50	14	33.0	1.48
Chehalis	49	18	35.8	5.23
Colfax †	46	10	32.0	1.29
Conconully †	35	6	23.4	2.40
East Sound †	52	28	36.9	1.92
Elbe				4.79

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Washington—Cont'd	°	°	°	*Ins.*
Ellensburg†	40	— 4	24.1	1.04
Ellensburg (near)	40	— 1	26.0	0.76
Everett	50	19	36.0	4.05
Ferry†	54	14	38.1	5.48
Fort Simcoe	49	14	31.2	3.20
Fort Spokane	47	— 5	27.0	1.90
Fort Townsend	48	22	35.4	3.55
Grand Mound *[1]	48	20	36.8	5.86
Hunters†	41	— 6	24.0	1.58
Index†	49	32	39.0	8.84
Kennewick†	55	11	34.5	0.55
Lakeside†	47	4	27.4	2.63
Lapush†	49	26	39.4	8.86
Madrone*†[1]	50	22	38.2	4.95
Moxee Valley†	49	1	29.3	2.84
Olga†	50	27	39.4	1.76
Pine Hill *[1]	49	22	34.4	3.58
Pullman†	43	11	30.2	1.54
Rosalia†	44	9	30.8	0.98
Silver Creek *[1]	50	19	36.4	4.84
Snohomish†	49	16	36.6	4.10
Stampede†	43	14	29.8	5.95
Stillaguamish†	50	12	32.2	2.22
Sunnyside†	46	2	29.8	0.61
Tacoma†	50	19	36.8	4.69
Union City *†[1]	45	19	32.2	5.57
Vashon†[g]	50	18	34.0	3.18
Waterville†	39	— 8	22.6	3.05
Wenatchee Lake†	36	1	23.8	2.40
West Ferndale†	53	22	38.0	3.45
West Virginia.				
Beverly†	66	—12	36.3	6.56
Bloomery†	57	— 1	31.5	2.50
Buckhannon *a*†				4.60
Burlington†	60	— 3	33.7	2.65
Central Station†				4.14
Charleston†				3.91
Cloverdale†				1.96
Elkhorn†	62	— 4	39.6	2.95
Ella†	59	— 4	36.4	4.72
Fairmont†				4.59
Forrest Hill	61	— 4	38.5	
Glenville†	61	—22	35.5	5.02
Grafton†	66	—11	36.0	4.74
Harpers Ferry†				2.31
Hinton†				2.77
Lake	61	— 5	38.6	3.82
Leachtown†				3.42
Madison†	67	— 9	37.1	4.18
Martinsburg†	58	1	33.8	3.18
Monarch *†[1]	62	— 2	38.6	3.90
Morgantown *a*†				3.56
Morgantown *b*†	80	—16	36.7	3.83
New Cumberland†	60	— 9	36.5	3.87
New Martinsv'le†	61	—12	37.3	3.60
Nuttallburg†	76	—20	36.4	2.60
Pennsboro†	65	—29	34.7	3.08
Philippi†				5.35
Pleasant Hill *[2]	62	—10	42.8	5.88
Point Pleasant†	65	— 5	37.1	3.83
Powellton	62	— 5	36.5	4.38
Raleigh†	60	— 5	31.7	3.07
Rowlesburg†				6.18
Sandyville†	62	—26	34.6	3.92
Spencer†	65	—21	35.1	6.02
Tannery *[1]	60	— 9	35.8	
Weston *a*†				5.31
Weston *b*[1]	60	— 6	37.9	5.39
Wheeling *a*†				4.02
Wheeling *b*†	62	— 4	37.5	4.15
Wisconsin.				
Amherst	58	— 8	27.8	1.35
Antigo†	51	—12	24.6	1.77
Apollonia *[3]	49	— 9	23.0	1.54
Ashland†		— 8		1.01
Barron†[j]	47	2	29.0	1.24
Wisconsin—Cont'd.	°	°	°	*Ins.*
Bayfield	46	— 4	27.2	0.25
Beaver Dam	49	— 5	28.4	0.79
Belleville	51	—10	27.9	0.20
Beloit	54	— 6	30.6	0.73
Berlin	57	— 5	30.4	0.65
Black River Falls†	54	— 8	27.2	2.59
Butternut†	50	—14	23.0	0.74
Centralia	54	—10	26.5	1.47
Chilton	59	— 7	29.0	1.15
Chippewa Falls†				1.40
City Point	51	—13	26.6	1.48
Columbus	45	— 5	22.2	1.65
Crandon†	50			0.80
Delavan†	54	— 6	30.1	0.40
Depere†	48	— 6	28.2	1.12
Eau Claire	54	—10	27.2	1.09
Florence†	51	—13	24.2	0.40
Fond du Lac†	49	— 9	26.6	0.99
Grantsburg†	58	— 7	29.8	1.37
Hartford†				0.83
Harvey†	55	— 5	29.3	1.12
Hayward†	47	—15	23.0	0.71
Hillsboro	54	— 4	29.0	0.98
Janesville	53	— 4	31.2	0.50
Koepenick *†[1]	54	—16	22.2	0.60
Lancaster†	51[f]	— 8*	26.3*	0.33
Madison†	49	— 4	29.0	0.67
Manitowoc†	50	— 4	29.4	0.48
Meadow Valley†	56	—10	26.6	1.14
Medford *b*†	51	—15	24.2	1.09
Menomonie	52	—19	23.2	1.68
Neillsville†	51	— 8	26.6	1.28
New Holstein[1]	52	— 7	26.9	2.47
Oconomowoc†	58	— 5	30.0	0.61
Oconto	52	— 5	28.6	1.86
Osceola†	46	—15	24.5	1.60
Oshkosh†	60	— 5	29.5	0.30
Pepin	54	—11	26.5	0.86
Pine River†	52	— 8	28.4	0.96
Portage†				1.50
Port Washington	57	— 5	30.7	0.68
Prairie du Chien	57	—11	27.5	
Racine *[10]	55	0	30.1	
Royalton	47	— 8	26.5	1.40
Sharon†	55	— 8	28.5	1.23
Shawano	52	— 7	27.8	0.99
Sheboygan *[9]	48	— 5	31.6	
Spooner†	46	—16	24.7	0.31
Stevens Point†	51	—10	27.2	1.40
Sturgeon B. Canal*	48	— 4	29.3	
Valley Junction†	54	— 9	28.4	1.10
Viroqua	50	— 8	27.6	1.94
Watertown†	54	—10	28.8	1.12
Waukesha†	52	— 9	29.2	0.51
West Bend	50	— 2	31.0	0.38
Westfield†	49	— 9	29.6	0.80
Weston *†[3]		— 8	24.9	1.24
Wyoming.				
Big Horn Ranch†	49	— 8	22.7	0.01
Fort Laramie†	64	—18	29.7	0.25
Fort Washakie	50	—20	20.4	0.00
Fort Yellowstone†	43	—17	19.9	1.34
La Barge†	50			0.49
Laramie	51	—27	21.5	0.23
Saratoga†	52	—29	19.0	1.00
Sheridan	59	—20	22.6	0.20
Sundance	52	—18	26.7	1.36
Mexico.				
Ciudad P. Diaz	81	26	58.2	0.04
Leon de Aldamas	74	34	56.4	T.
Mexico	72	34	53.3	0.02
Puebla	70	39	55.4	0.40
Topolobampo *[1]	87	59	70.3	2.75
Vera Cruz	82	59	72.5	1.90
West Indies.				
Ciudad P. Diaz	81	26	58.2	0.04
Leon de Aldamas	74	34	56.4	T.
Mexico	72	34	53.3	0.02
Puebla	70	39	55.4	0.40
Topolobampo *[1]	87	59	70.3	2.75
Vera Cruz	82	59	72.5	1.90
GrandTurk Island				6.72

Reports received too late to be used in general discussion of weather for December, 1894.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Massachusetts.	°	°	°	*Ins.*
Hadley	48	—12	24.8	
Missouri.				
Centerville				4.27
Oregon.				
Cascade Locks	48	26	36.6	6.94
Oregon City*	48	27		5.67
East Portland*	54	26		4.95

Received too late for publication in November, 1894.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
California.	°	°	°	*Ins.*
Davisville *b*	89	35	64.2	0.35
Sneddens Ranch				0.00
Upper Mattole*	83	34	57.7	5.52
Iowa.				
Fayette	53	1	30.1	1.26
Kansas.				
Salina	80	22	50.3	T.

Reports received too late, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Massachusetts.	°	°	°	*Ins.*
Turners Falls	61	14	35.0	2.98
Missouri.				
Centerville				2.29
Montana.				
Choteau	72	— 2	37.4	0.40
Nebraska.				
Lincoln	72	11	38.4	T.
Texas.	°	°	°	*Ins.*
Forestburg	82	22	56.4	0.00
Washington.				
Sulphur[a]	64	21	43.3	0.03
West Virginia.				
Pleasant Hill				3.00
Mexico.				
Vera Cruz	82	68	74.5	2.06

EXPLANATION OF SIGNS.

*Extremes of temperature from observed readings of dry thermometer.

†Weather Bureau instruments.

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

[1] Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. + 4.
[2] Mean of 8 a. m. + 8 p. m. + 2.
[3] Mean of 7 a. m. + 7 p. m. + 2.
[4] Mean of 6 a. m. + 6 p. m. + 2.
[5] Mean of 7 a. m. + 2 p. m. + 2.
[6] Mean from readings at various hours reduced to true daily mean by special tables.
[7] Mean from hourly readings of thermograph.
[8] Mean of 7 a. m. + 2 p. m. + 9 p. m. + 3.
[9] Mean of sunrise and noon.
[10] Mean of sunrise, noon, sunset, and midnight.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

An Italic letter following the name of a station, as "Livingston *a*," "Livingston *b*," indicates that two or more observers, as the case may be, are reporting from the same station. A small Roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance, "[a]" denotes 14 days missing.

No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice.

Corrections: North Dakota, Gallatin, January, 1894, mean temperature should be —2.6°, instead of 2.6°. Rhode Island, Providence *a*, May, 1894, mean temperature should be 60.5°, instead of 68.5°. Kansas, Lawrence, June, 1894, strike out all data and enter 96°, 56°, 76.1°, 6.04. Nebraska, Stanton, November, 1894, mean temperature should be 33.1°, instead of 44.1°. Colorado, Surface Creek, August, 1894, make mean temperature 68.2°, instead of 82.3°.

NOTE.—The following changes have been made in the names of stations: New York, Eden Center, changed to Eden. South Carolina, Hollands Store, changed to Holland.

TABLE III.—*Data from Canadian stations for the month of December*, 1894.

Station.	Pressure. Mean not reduced.	Mean reduced.	Departure from normal.	Temperature. Mean.	Departure from normal.	Precipitation. Total.	Departure from normal.	Prevailing direction of wind.
	Inches.	*Inches.*	*Inches.*	°	°	*Inches.*	*Inches.*	
St. Johns, N. F	29.84	29.99	+ .15	29.2	— 1.2	3.87	.....	n.
Sydney, N. S	29.98	30.04	+ .16	29.0	0.0	4.07	— 0.65	nw.
Grindstone, G. St. L	.....	.....	.....	.....	.....	.....	.....	.....
Halifax, N. S	29.93	30.07	+ .12	28.4	— 0.1	4.57	— 0.72	w.
Grand Manan, N. B	30.02	30.07	.....	30.4	.....	3.40	— 1.27	w.
Yarmouth, N. S	29.98	30.06	+ .08	31.0	— 0.5	3.41	— 1.86	n.
Saint Andrews, N. B	29.98	30.03	.....	25.2	.....	2.60	— 0.96	nw.
Charlottetown, P. E. I	29.98	30.02	.....	26.6	.....	3.74	— 0.26	w.
Chatham, N. B	30.00	30.02	+ .08	18.6	+ 2.1	2.55	— 0.42	w.
Father Point, Que	30.00	30.03	+ .08	17.8	+ 1.8	2.58	+ 0.36	s.
Quebec, Que	29.72	30.07	+ .06	17.4	+ 1.4	2.52	— 1.79	nw.
Montreal, Que	29.86	30.08	+ .05	21.4	+ 1.9	2.79	— 0.77	w.
Rockliffe, Ont	29.50	30.04	+ .01	17.1	+ 2.6	2.94	+ 0.20	se.
Kingston, Ont	29.76	30.09	+ .04	27.3	+ 2.3	1.70	— 1.94	sw.
Toronto, Ont	29.68	30.06	+ .02	30.2	+ 2.2	2.14	— 0.40	sw.
White River, Ont	28.60	30.04	.....	13.6	+ 4.8	1.68	+ 0.24	s.
Port Stanley, Ont	29.43	30.10	+ .03	31.5	.....	2.71	+ 0.10	w.
Saugeen, Ont	29.31	30.06	+ .04	30.2	+ 3.2	2.91	— 1.22	w.
Parry Sound, Ont	29.30	30.03	.00	25.7	+ 4.7	3.96	+ 0.03	w.
Port Arthur, Ont	29.24	29.98	— .04	18.8	+ 8.3	1.16	+ 0.31	w.
Winnipeg, Man	29.14	30.03	— .07	13.4	+10.4	0.55	— 0.64	nw.
Minnedosa, Man	28.10	30.02	— .08	12.0	+ 9.5	0.22	— 0.51	nw.
Qu'Appelle, Assiniboia	27.65	30.05	— .07	12.2	+ 8.2	0.33	— 0.31	s.
Medicine Hat, Assiniboia	27.61	30.02	— .08	21.3	+ 6.3	0.06	— 0.30	sw.
Swift Current, Assiniboia	27.36	30.09	— .03	15.8	+ 4.8	0.37	— 0.34	w.
Calgary, Alberta	26.27	29.98	— .14	19.0	+ 4.5	0.40	— 0.38	w.
Prince Albert, Sask	28.42	30.05	.....	7.0	.....	0.21	.....	e.
Edmonton, Alberta	27.54	30.02	.00	13.4	— 0.3	0.12	— 0.28	s.
Battleford, Saskatchew'n	28.16	30.03	.....	6.2	.....	0.42	.....	se.
Spences Bridge, B. C	29.22	30.09	.....	26.2	.....	0.49	.....	e.
Hamilton, Bermuda	29.97	30.13	+ .01	63.7	.....	5.95	.....	n.
Esquimault	29.92	29.95	.....	38.2	.....	1.18	.....	n.
Banff, Alberta	25.26	30.14	.....	14.6	.....	0.36	.....	w.

TABLE IV *a*.—*Hourly sunshine as deduced from sunshine recorders, December*, 1894.

Station.	Instrument.	Percentage for each hour of local mean time ending with the respective hour.																Monthly summary.			
		A. M.								P. M.								Instrumental record.			Personal estimate.
		5	6	7	8	9	10	11	Noon.	1	2	3	4	5	6	7	8	Actual.	Possible.	Per cent of possible.	
																		Hours.	*Hours.*		
Baltimore, Md	T.	.....	.....	.....	43	56	71	74	73	76	77	73	58	45	.....	.....	.....	193.3	294.2	66	55
Bismarck, N. Dak	P.	.....	.....	.....	53	55	66	68	60	55	59	55	49	49	.....	.....	.....	154.4	266.3	58	55
Boston, Mass	T.	.....	.....	.....	29	47	52	60	64	58	59	58	47	28	.....	.....	.....	147.9	284.6	52	45
Buffalo, N. Y	T.	.....	.....	.....	14	23	41	45	59	53	45	41	29	11	.....	.....	.....	108.5	281.5	39	29
Chicago, Ill	T.	.....	.....	.....	34	31	38	54	61	59	56	41	35	40	.....	.....	.....	129.8	285.3	45	44
Cincinnati, Ohio	P.	.....	.....	.....	38	48	48	43	46	50	51	49	42	39	.....	.....	.....	133.4	294.0	45	40
Cleveland, Ohio	P.	.....	.....	.....	17	14	25	29	26	28	32	35	24	15	.....	.....	.....	72.3	286.5	25	31
Columbus, Ohio	T.	.....	.....	.....	14	18	34	41	44	48	53	47	36	27	.....	.....	.....	108.6	291.5	37	37
Denver, Colo	P.	.....	.....	.....	45	54	74	83	80	91	91	82	65	54	.....	.....	.....	213.8	292.4	73	65
Des Moines, Iowa	T.	.....	.....	.....	48	48	55	57	54	57	63	61	52	57	.....	.....	.....	158.7	286.5	55	51
Detroit, Mich	T.	.....	.....	.....	33	35	34	36	37	44	43	48	33	32	.....	.....	.....	107.5	285.1	38	34
Dodge City, Kans	P.	.....	.....	0	62	68	80	78	72	75	76	68	69	61	.....	.....	.....	212.7	297.9	71	63
Eastport, Me	P.	.....	.....	.....	38	40	50	58	54	58	56	49	48	43	.....	.....	.....	138.5	274.3	50	35
Galveston, Tex	P.	.....	.....	12	26	58	66	79	75	66	69	72	73	64	43	.....	.....	202.9	319.9	63	62
Helena, Mont	P.	.....	.....	.....	28	32	50	63	62	64	61	61	50	44	.....	.....	.....	144.0	267.8	54	49
Kansas City, Mo	P.	.....	.....	.....	41	47	58	64	65	70	74	66	51	52	.....	.....	.....	174.6	293.9	59	57
Key West, Fla	T.	.....	.....	42	53	64	81	91	92	92	93	84	85	75	66	.....	.....	260.9	329.2	79	67
Little Rock, Ark	T.	.....	.....	33	47	48	51	55	57	57	49	48	49	50	.....	.....	.....	156.8	305.8	51	40
Louisville, Ky	T.	.....	.....	.....	23	30	44	51	53	54	55	51	44	45	.....	.....	.....	134.6	296.0	45	35
Memphis, Tenn	P.	.....	.....	33	52	58	59	60	53	57	58	53	53	51	.....	.....	.....	169.1	305.0	55	59
New Haven, Conn	T.	.....	.....	.....	48	54	63	70	73	74	73	65	51	45	.....	.....	.....	180.2	287.4	63	56
New Orleans, La	T.	.....	.....	20	29	55	74	84	80	76	75	73	63	51	52	.....	.....	206.8	317.8	65	65
New York, N. Y	T.	.....	.....	.....	21	25	48	55	61	62	59	53	28	24	.....	.....	.....	131.1	288.3	45	43
Norfolk	T.	.....	.....	67	37	62	75	81	85	80	79	75	71	54	.....	.....	.....	212.2	299.2	71	60
Philadelphia, Pa	T.	.....	.....	.....	45	47	54	58	59	56	59	61	61	59	.....	.....	.....	163.7	291.4	56	49
Portland, Me.*		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portland, Oreg	P.	.....	.....	.....	24	21	25	32	28	34	38	39	30	27	.....	.....	.....	82.8	272.7	30	43
Do	T.	.....	.....	.....	24	25	31	54	56	55	57	47	32	27	.....	.....	.....	117.1	272.7	43	43
Rochester, N. Y	T.	.....	.....	.....	13	17	22	30	34	33	35	34	28	29	.....	.....	.....	78.8	281.5	28	28
St. Louis, Mo	T.	.....	.....	.....	32	43	51	59	62	61	63	62	65	65	.....	.....	.....	166.9	295.4	56	51
Salt Lake City, Utah	T.	.....	.....	.....	25	29	49	61	72	65	60	62	48	32	.....	.....	.....	150.0	289.1	52	38
San Diego, Cal	P.	.....	.....	29	22	30	42	49	56	52	49	49	49	20	0	.....	.....	130.7	310.2	42	42
San Francisco, Cal	T.	.....	.....	.....	16	33	48	61	65	72	62	54	39	15	.....	.....	.....	142.3	297.3	48	26
Santa Fe, N. Mex	P.	.....	.....	71	47	51	61	66	62	73	70	68	58	44	.....	.....	.....	183.6	305.0	60	51
Savannah, Ga	P.	.....	.....	47	58	74	78	75	75	74	73	72	73	57	50	.....	.....	220.9	313.6	70	63
Seattle †	T.	.....	.....	.....	34	31	36	43	46	46	40	37	27	22	.....	.....	.....	92.5	248.8	37	38
Spokane, Wash	P.	.....	.....	.....	6	20	32	36	39	31	41	36	34	31	.....	.....	.....	85.8	263.6	33	26
Tucson, Ariz	P.	.....	.....	41	29	24	34	41	39	40	46	49	49	37	6	.....	.....	121.6	313.0	39	32
Vicksburg, Miss	T.	.....	.....	9	23	41	46	56	80	75	72	69	61	52	33	.....	.....	176.5	312.6	56	53
Washington, D. C	T.	.....	.....	7	39	42	49	57	64	66	66	58	52	51	.....	.....	.....	161.3	293.9	55	53
Wilmington, N. C	T.	.....	.....	31	42	50	59	63	69	72	72	65	54	44	.....	.....	.....	181.4	307.9	59	58

*No record. †Record for 29 days.

TABLE IV *b*.—*Hourly precipitation, December*, 1894.

Station.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Total.
Atlanta, Ga*	0.09	0.03	0.01	0.10	0.01	T.	0.01	0.04	0.25	0.05	0.10	0.13	0.19	0.10	0.08	0.08	0.26	0.17	0.03	0.05	0.06	0.03	0.31	0.48	2.68
Baltimore, Md	0.37	0.61	0.22	0.20	0.13	0.06	0.06	0.04	0.05	0.08	0.10	0.29	0.06	0.12	0.14	0.19	0.13	0.12	0.13	0.07	0.12	0.15	0.24	0.36	4.09
Bismarck, N. Dak	T.	0.01	T.	T.	T.	T.	T.	0.00	T.	T.	T.	T.	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	T.	0.01	T.	T.	0.06
Boston, Mass	0.14	0.15	0.18	0.17	0.16	0.15	0.17	0.26	0.31	0.51	0.63	0.23	0.12	0.08	0.13	0.12	0.13	0.06	0.02	0.04	0.03	0.13	0.07	0.12	4.11
Buffalo, N. Y	0.10	0.14	0.12	0.08	0.11	0.08	0.13	0.23	0.10	0.21	0.11	0.05	0.05	0.06	0.04	0.03	0.03	T.	0.19	0.26	0.10	0.14	0.11	0.04	2.51
Chicago, Ill*	T.	T.	T.	T.	0.03	0.01	0.01	T.	T.	T.	T.	T.	T.	T.	0.11	0.04	0.03	0.01	T.	T.	0.01	T.	T.	T.	0.25
Cincinnati, Ohio	0.03	0.01	0.02	0.44	0.27	0.23	0.09	0.09	0.06	0.10	0.07	0.22	0.10	0.13	0.11	0.16	0.14	0.20	0.13	0.10	0.12	0.13	0.14	0.07	3.16
Cleveland, Ohio*	0.03	0.03	0.04	0.05	0.09	0.20	0.24	0.35	0.14	0.06	0.04	0.02	0.02	0.02	0.05	0.06	0.08	0.07	0.05	0.04	0.03	0.04	0.06	0.06	1.98
Denver, Colo*	0.03	0.03	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.05	0.03	0.03	0.03	0.02	0.00	0.00	0.00	0.02	0.05	0.01	T.	0.08	0.08	0.08	0.69
Detroit, Mich	T.	T.	0.00	0.00	0.00	0.03	0.05	0.14	0.07	0.04	0.10	0.00	0.20	0.14	0.05	0.08	0.18	0.12	0.11	0.04	0.06	0.09	T.	T.	1.56
Dodge City, Kans*	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.01	0.01	T.	0.02	0.03	0.03	0.06	0.06	0.04	0.08	0.07	0.06	0.04	0.03	0.01	0.01	0.62
Duluth, Minn.*	0.11	0.12	0.08	0.09	0.09	0.06	0.11	0.13	0.22	0.11	0.05	0.01	T.	0.01	0.01	T.	T.	T.	0.05	0.16	0.06	0.08	0.12	0.14	1.85
Eastport, Me.*	0.01	0.01	T.	0.01	T.	0.01	0.01	0.05	0.09	0.11	0.09	0.10	0.09	0.19	0.11	0.13	0.11	0.14	0.05	0.03	0.03	T.	T.	0.01	2.17
Galveston, Tex	T.	0.00	0.00	0.00	0.21	T.	0.00	T.	0.01	T.	T.	0.01	0.01	0.05	T.	T.	T.	0.02	0.04	0.02	0.14	0.10	0.02	0.04	0.67
Indianapolis, Ind*	0.07	0.21	0.30	0.03	0.03	0.04	0.04	0.20	0.16	0.10	0.11	0.16	0.13	0.10	0.13	0.04	0.01	0.01	0.01	0.05	0.02	0.03	0.03	0.02	2.03
Jacksonville, Fla	T.	0.01	0.02	0.05	0.04	0.03	0.02	0.03	T.	T.	0.02	0.01	0.00	T.	0.02	T.	T.	0.00	T.	T.	0.17	0.31	0.08	T.	0.81
Jupiter, Fla	0.04	0.03	0.03	0.02	0.01	T.	T.	0.01	0.00	0.00	0.01	0.02	0.17	0.07	0.01	T.	0.02	0.01	0.01	0.34	0.08	0.01	0.02	0.02	0.99
Kansas City, Mo	0.09	0.13	0.04	0.03	0.03	0.01	T.	T.	T.	T.	0.02	0.03	0.05	0.05	0.01	0.02	0.03	0.03	0.01	T.	0.02	0.08	0.03	0.10	0.80
Key West, Fla	0.00	0.00	0.00	0.08	0.11	0.06	0.00	0.01	T.	T.	T.	0.00	T.	T.	0.00	0.00	T.	T.	T.	0.00	0.00	0.00	0.00	0.00	0.26
Little Rock, Ark	0.03	0.14	0.14	0.06	0.02	T.	0.50	0.26	0.13	0.09	0.18	0.11	T.	T.	0.00	0.00	0.00	T.	0.10	0.76	0.73	0.36	0.29	0.05	3.95
Louisville, Ky	0.39	0.40	0.18	0.02	0.08	0.12	0.30	0.39	0.14	0.05	0.32	0.14	0.26	0.20	0.22	0.30	0.27	0.28	0.19	0.15	0.20	0.21	0.16	0.20	5.17
Marquette, Mich.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Memphis, Tenn*	0.20	0.12	0.09	0.13	0.11	0.52	0.56	0.22	0.14	0.21	0.15	0.03	0.13	0.18	0.07	0.06	0.11	0.06	0.01	T.	0.21	0.11	0.18	0.28	3.88
Milwaukee, Wis.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nantucket, Mass	0.21	0.15	0.29	0.35	0.68	0.45	0.46	0.29	0.18	0.11	0.57	0.46	0.07	0.07	0.04	0.16	0.36	0.11	0.14	0.13	0.21	0.10	0.13	0.14	5.86
Nashville, Tenn	0.10	0.07	0.05	0.27	0.30	0.18	0.37	0.21	0.16	0.08	0.27	0.13	0.03	0.01	0.02	0.02	0.02	0.05	0.05	0.04	0.08	0.12	0.05	0.05	2.73
New Orleans, La.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New York, N. Y	0.16	0.24	0.34	0.26	0.34	0.73	0.71	0.41	0.16	0.14	0.04	0.03	0.05	0.13	0.23	0.24	0.05	0.15	0.18	0.19	0.10	0.14	0.10	0.11	5.22
Norfolk, Va	0.01	0.11	0.08	0.09	0.05	0.13	0.14	0.03	0.05	0.08	0.23	0.23	0.15	0.13	0.08	0.04	0.01	T.	0.01	0.01	0.06	0.22	0.27	0.09	2.33
Omaha, Nebr.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philadelphia, Pa*	0.22	0.17	0.27	0.41	0.19	0.30	0.27	0.11	0.04	0.02	T.	0.04	0.19	0.16	0.23	0.09	0.12	0.14	0.10	0.07	0.19	0.13	0.13	0.16	3.65
Pittsburg, Pa.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portland, Me.*	0.08	0.09	0.10	0.10	0.08	0.06	0.05	0.04	0.11	0.16	0.13	0.06	0.09	0.09	0.14	0.09	0.04	0.04	0.02	0.02	0.05	0.02	0.04	0.05	1.75
Portland, Oreg	0.22	0.23	0.22	0.15	0.15	0.19	0.11	0.11	0.09	0.12	0.11	0.10	0.08	0.08	0.12	0.11	0.19	0.25	0.19	0.10	0.09	0.10	0.15	0.17	3.47
Rochester, N. Y.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis, Mo.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Paul, Minn	0.03	T.	0.14	0.07	0.01	0.02	0.01	T.	T.	0.02	0.02	0.02	0.01	T.	T.	0.01	0.13	0.02	0.06	0.19	0.17	0.20	0.20	0.07	1.40
Salt Lake City, Utah*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Diego, Cal	0.02	0.14	0.15	0.10	0.01	0.03	0.03	0.13	0.01	0.06	0.05	T.	0.01	0.05	0.14	0.36	0.07	0.03	0.01	0.14	0.37	0.14	0.18	0.04	2.23
San Francisco, Cal	0.30	0.21	0.30	0.29	0.63	0.87	0.73	0.51	0.65	0.37	0.41	0.36	0.27	0.31	0.32	0.28	0.15	0.20	0.10	0.09	0.11	0.21	0.74	0.36	8.73
Savannah, Ga*	0.00	0.05	0.06	0.04	0.08	0.06	0.07	0.06	0.04	T.	T.	T.	0.00	0.00	0.00	0.00	0.00	T.	T.	0.03	0.07	0.05	0.04	0.00	0.68
Seattle, Wash	0.22	0.27	0.28	0.14	0.18	0.27	0.16	0.14	0.15	0.08	0.10	0.08	0.04	0.05	0.06	0.08	0.09	0.17	0.24	0.19	0.07	0.15	0.18	0.21	3.69
Vicksburg, Miss	0.17	0.87	0.73	0.10	0.06	0.25	0.12	0.06	0.05	0.11	0.35	0.25	0.24	0.44	0.65	0.23	0.26	0.04	0.11	0.11	0.08	0.31	0.62	0.17	6.41
Washington, D.C	0.57	0.26	0.31	0.15	0.25	0.06	0.04	0.06	0.05	0.03	0.31	0.09	0.09	0.18	0.15	0.19	0.11	0.06	0.07	0.13	0.15	0.19	0.27	0.28	3.95
Wilmington, N. C	0.02	T.	0.00	0.00	T.	0.01	0.02	0.05	0.04	0.00	0.02	0.03	0.03	0.03	0.05	0.04	0.05	0.05	0.01	0.06	0.02	0.12	0.02	0.05	0.78

*Record incomplete.

TABLE V.—*Mean temperature for each hour of seventy-fifth meridian time, December, 1894.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex	45.0	44.1	43.7	43.1	42.2	41.5	41.0	40.4	39.6	41.3	45.0	48.2	50.4	52.5	54.2	55.4	56.2	55.4	53.1	50.5	48.3	47.0	46.3	45.5	47.1
Albany, N. Y	27.6	27.0	26.6	26.5	26.3	26.2	26.0	26.3	27.2	28.7	30.9	32.6	33.9	34.5	34.2	33.8	32.5	31.0	30.1	29.5	28.6	27.8	27.6	27.2	29.3
Alpena, Mich	28.0	28.0	27.7	27.5	27.0	26.8	26.5	26.4	26.6	27.7	29.4	30.8	31.7	32.3	32.3	32.0	31.5	30.8	30.2	29.6	29.1	28.8	28.3	28.0	29.0
Amarillo, Tex	34.9	34.0	33.0	32.7	32.2	31.4	30.9	30.6	30.2	33.0	37.3	40.6	44.1	46.4	47.8	48.4	48.3	46.7	43.4	41.2	39.0	37.6	35.6	35.1	38.1
Atlanta, Ga	43.8	43.4	42.8	41.9	41.5	41.0	40.9	40.6	41.5	43.4	46.2	48.8	50.8	52.3	53.1	52.9	51.9	50.1	48.7	47.3	46.4	45.3	44.4	43.7	45.9
Augusta, Ga	44.6	43.9	42.9	42.6	42.0	41.7	41.4	41.8	43.4	46.2	49.7	52.8	54.9	56.4	57.2	57.0	55.9	53.9	51.8	49.8	48.2	47.1	45.8	44.8	48.2
Baker City, Oreg	24.8	25.0	24.6	24.4	24.5	23.8	23.5	22.9	22.8	22.7	23.1	25.3	28.1	30.6	31.4	31.9	32.4	31.9	30.1	28.5	27.3	25.8	25.2	24.5	26.5
Baltimore, Md	35.5	35.2	34.7	34.6	34.2	33.8	33.7	33.9	34.6	36.4	37.9	39.4	40.3	41.5	42.0	41.8	40.8	39.9	39.0	38.0	37.5	36.8	36.3	35.5	37.2
Bismarck, N. Dak	18.2	17.7	17.1	16.6	15.8	15.1	14.6	14.7	13.7	15.1	18.2	22.5	27.0	29.9	31.3	31.7	31.2	27.8	24.6	22.5	21.1	20.1	19.5	18.5	21.0
Boston, Mass	30.3	30.2	30.0	29.7	29.6	29.4	29.4	30.3	30.5	32.2	33.8	35.1	36.1	37.2	37.0	36.2	35.2	34.3	33.3	32.0	31.5	31.5	30.8	30.5	32.3
Buffalo, N. Y	33.5	33.2	32.9	32.7	32.7	32.7	32.6	32.5	32.6	33.5	34.5	35.3	35.3	35.8	36.0	35.6	35.5	34.9	34.5	34.3	33.9	33.7	33.5	33.1	34.0
Charleston, S. C	49.9	49.1	48.4	48.2	47.6	47.0	46.6	47.2	48.8	51.6	53.8	55.6	57.3	58.2	58.1	57.3	55.9	54.3	53.4	52.4	51.9	51.4	50.9	49.9	51.9
Charlotte, N. C	41.1	40.6	40.3	39.6	39.5	38.7	38.4	38.3	39.2	41.8	44.5	46.4	48.4	49.5	50.2	50.0	49.1	47.6	46.5	45.3	44.0	43.2	42.1	41.3	43.6
Cheyenne, Wyo	24.6	24.5	24.5	24.2	24.2	24.0	23.5	23.9	23.9	25.3	28.2	31.6	32.8	34.2	34.9	35.2	34.2	31.7	27.9	26.4	25.0	24.7	24.4	24.4	27.4
Chicago, Ill	31.6	31.1	31.1	31.1	30.8	30.7	30.6	30.5	30.5	30.8	32.1	33.4	34.4	35.2	35.8	35.8	35.5	34.6	34.1	33.6	32.7	32.1	31.7	31.3	32.5
Cincinnati, Ohio	37.2	36.7	36.1	35.6	35.1	34.5	34.1	33.8	34.3	35.4	36.7	38.3	39.3	40.1	41.0	41.3	41.3	40.9	40.0	39.1	38.4	37.6	37.2	36.5	37.5
Cleveland, Ohio	33.5	33.5	33.2	33.0	32.9	32.6	32.6	32.5	32.7	33.2	34.1	35.1	35.0	36.2	36.5	36.5	36.4	35.8	34.8	34.3	34.0	33.8	33.4	33.0	34.1
Columbus, Ohio	33.4	33.1	32.9	32.7	32.2	32.0	31.8	32.0	32.5	33.6	34.7	35.6	37.0	37.8	38.5	38.7	37.7	37.0	36.4	35.5	34.7	34.0	33.5	32.9	34.6
Denver, Colo	27.5	26.9	26.6	26.2	25.8	25.6	25.7	24.8	24.8	25.9	28.9	33.3	37.6	39.9	41.8	42.3	41.5	40.0	37.3	34.6	32.1	30.1	28.2	27.3	31.5
Des Moines, Iowa	31.4	31.1	30.1	29.5	28.9	28.2	27.6	27.7	27.8	29.2	31.3	33.4	34.9	36.5	37.7	38.7	38.6	37.3	35.9	34.9	33.9	33.4	32.3	31.5	32.6
Detroit, Mich	31.3	31.0	30.8	30.5	30.4	30.3	30.0	29.9	30.1	31.1	32.2	33.4	34.3	35.0	35.5	35.2	34.3	33.6	33.1	33.0	32.4	32.1	31.6	31.0	32.2
Dodge City, Kans	29.8	29.2	28.5	27.8	27.3	26.5	25.5	25.0	24.9	26.4	30.4	35.0	38.6	40.9	42.8	43.9	43.7	42.1	38.4	35.2	34.0	32.7	31.5	30.0	32.9
Duluth, Minn	24.8	24.5	24.3	24.1	24.0	23.6	23.5	23.3	23.3	23.6	24.6	25.6	26.8	27.9	28.7	29.0	28.8	28.1	27.2	26.5	26.0	25.6	25.2	24.7	25.6
Eastport, Me	26.8	26.7	26.4	26.1	25.8	25.5	25.3	25.4	26.2	27.4	28.5	29.4	30.6	31.3	31.2	30.7	30.5	30.3	29.8	29.5	29.2	28.7	28.1	27.5	28.2
El Paso, Tex	45.8	45.1	44.4	42.8	41.9	41.3	40.7	40.3	39.3	39.8	43.5	47.7	50.9	53.1	54.8	56.1	57.0	57.0	55.4	52.1	50.7	49.1	47.6	46.4	47.6
Fort Smith, Ark	41.9	41.3	40.8	40.3	39.2	39.0	38.4	38.2	38.7	41.1	43.9	46.7	49.2	50.5	51.6	52.4	51.8	50.1	48.6	47.5	45.8	44.1	42.8	41.5	44.4
Galveston, Tex	58.9	58.5	57.8	57.2	56.8	56.5	56.1	55.9	55.9	56.7	58.2	59.2	60.3	60.8	61.4	61.5	61.4	60.8	60.2	59.7	59.5	59.4	59.1	58.6	58.8
Grand Haven, Mich	33.5	33.1	32.9	32.7	32.0	31.9	31.8	31.7	31.5	32.1	32.7	33.1	33.3	33.4	33.6	33.7	34.1	34.1	34.0	34.1	34.1	34.1	34.0	33.9	33.5	33.1
Havre, Mont	22.7	22.0	21.8	21.3	20.4	19.9	18.9	18.5	17.6	17.3	18.4	21.0	24.3	26.7	28.5	29.7	29.8	28.4	25.9	25.1	23.6	23.4	23.6	23.2	23.0
Helena, Mont	23.3	22.5	21.9	21.5	20.7	20.2	20.0	19.6	19.2	19.4	20.2	21.6	23.2	25.3	27.4	28.3	29.1	29.1	27.8	26.5	25.8	25.2	24.4	23.8	23.6
Huron, S. Dak	21.3	20.7	19.6	19.3	18.8	19.1	19.3	19.1	18.3	19.8	24.4	28.3	31.2	34.3	36.1	36.9	35.9	32.6	29.2	27.0	25.6	23.6	22.4	21.4	25.2
Independence, Cal	37.0	37.1	36.5	36.0	36.0	35.5	35.3	34.5	33.7	33.5	33.7	36.2	38.4	40.5	42.3	43.9	44.3	44.0	42.9	40.9	39.5	38.9	38.3	37.7	38.2
Indianapolis, Ind	34.8	34.4	33.9	33.6	33.2	33.1	32.8	32.8	33.3	34.5	36.5	37.9	39.0	40.3	41.1	41.1	40.4	38.9	37.4	36.5	35.7	35.2	34.7	34.3	36.1
Jacksonville, Fla	53.7	53.1	52.5	52.0	51.5	51.2	50.8	51.1	53.2	56.1	58.7	60.9	62.4	63.2	63.5	63.3	61.8	59.5	58.3	57.2	56.3	55.5	54.4	53.6	56.4
Kansas City, Mo	35.4	34.9	34.2	33.8	33.1	32.8	32.2	31.8	31.4	32.7	35.2	37.8	39.6	41.9	43.5	44.2	43.8	42.5	40.8	39.6	38.3	37.4	36.4	35.9	37.0
Key West, Fla	68.8	68.9	68.7	68.3	68.2	68.0	67.8	68.2	69.0	69.9	70.6	71.0	71.4	71.6	71.5	71.3	70.7	69.8	69.5	69.4	69.2	69.1	68.8	68.4	69.5
Knoxville, Tenn	39.9	39.4	38.9	38.4	37.8	37.3	37.0	36.8	37.3	39.0	41.0	43.0	44.7	45.9	46.6	47.1	46.8	46.0	44.9	43.8	42.5	41.7	40.7	39.9	41.5
Lander, Wyo	15.7	15.3	14.9	13.9	13.1	12.3	11.5	10.6	10.3	10.1	14.3	20.9	25.6	28.5	30.6	31.5	32.1	30.3	25.0	20.7	18.9	17.2	16.4	16.1	19.0
Little Rock, Ark	43.4	42.4	41.8	41.5	40.9	40.1	39.8	39.8	39.7	41.5	43.5	46.1	47.8	49.1	50.5	51.5	51.5	50.6	49.1	47.5	46.1	44.8	44.0	43.1	44.8
Louisville, Ky	38.7	38.1	37.7	36.9	36.2	35.6	35.2	35.1	35.4	36.8	38.5	40.6	42.6	44.2	44.8	44.9	44.2	43.1	42.3	41.0	40.2	39.5	38.8	38.1	39.5
Lynchburg, Va	37.4	36.7	36.0	35.8	35.5	35.1	35.1	35.3	38.7	41.8	44.2	46.0	47.4	48.1	48.3	47.4	45.6	43.4	40.5	39.9	38.8	38.1	37.5	40.3
Marquette, Mich	27.4	27.0	26.6	26.1	26.2	26.3	26.3	26.2	26.1	26.7	28.2	29.4	30.4	30.9	31.3	30.9	30.2	29.2	28.7	28.1	28.1	27.9	27.8	27.5	28.1
Memphis, Tenn	44.3	43.6	42.9	42.4	42.0	41.6	41.1	40.9	41.5	43.2	44.9	46.9	47.8	49.1	49.9	50.2	49.9	48.9	47.9	47.1	46.3	45.5	44.7	44.0	45.3
Milwaukee, Wis	30.2	29.8	29.6	29.6	29.2	29.1	28.6	28.5	28.6	29.7	31.3	33.1	34.5	35.1	35.2	35.2	34.5	33.2	32.4	31.8	31.3	30.8	30.5	30.0	31.3
Montgomery, Ala	48.6	48.0	47.1	46.5	45.9	45.1	44.8	44.5	46.0	48.1	51.6	54.2	56.8	58.0	59.3	58.8	58.5	56.9	54.6	53.7	52.0	50.7	49.7	48.7	51.2
Moorhead, Minn	19.2	18.5	18.3	17.8	17.5	17.2	17.0	17.1	16.5	17.5	19.6	21.9	24.0	25.6	26.8	27.2	26.9	25.1	23.6	22.6	21.3	20.3	19.2	18.9	20.8
Nantucket, Mass	35.5	35.4	35.5	35.5	35.4	35.5	35.5	36.0	37.0	37.8	38.5	38.5	38.7	38.7	38.3	37.6	36.7	36.4	36.5	36.4	36.4	36.0	35.7	35.4	36.6
Nashville, Tenn	41.1	40.1	39.5	39.0	38.0	37.5	37.0	36.8	37.7	39.3	41.8	44.0	45.7	46.6	47.3	47.6	47.4	46.3	45.2	44.5	43.6	42.5	41.3	40.6	42.1
New Haven, Conn	29.8	29.7	29.3	29.2	29.0	28.6	28.5	28.7	29.4	31.5	33.8	35.5	36.3	36.5	36.1	35.5	34.6	34.1	33.2	32.2	31.4	30.7	30.3	29.9	31.8
New Orleans, La	55.3	55.1	54.7	54.3	53.4	53.0	52.7	52.5	52.5	54.2	57.5	59.9	61.8	62.4	63.1	63.1	63.0	61.9	60.5	59.2	57.9	56.9	56.2	55.1	57.4
New York, N. Y	34.2	33.9	33.7	33.7	33.5	33.5	33.5	33.6	34.4	34.9	36.3	37.5	38.1	38.8	39.1	38.9	38.2	37.3	36.5	36.0	35.5	35.0	34.7	34.2	35.6
Norfolk, Va	41.9	41.7	41.5	41.2	40.6	40.2	39.7	39.8	40.9	43.2	45.3	46.6	47.9	48.4	48.6	48.2	47.3	46.1	44.8	44.1	43.2	43.0	42.7	42.1	43.7
North Platte, Nebr	22.5	21.9	21.0	19.7	18.9	18.0	17.9	17.7	17.1	18.9	24.4	30.3	36.1	40.3	43.1	44.7	44.3	41.5	36.5	32.4	29.5	27.1	25.2	23.3	28.9
Omaha, Nebr	30.9	29.9	29.3	28.7	28.0	27.6	27.1	26.8	26.9	27.8	29.9	32.0	34.5	36.4	38.0	38.9	39.0	37.6	36.4	35.6	34.7	33.6	32.5	31.3	32.2
Parkersburg, W, Va	35.0	34.6	34.1	33.4	32.8	32.5	32.5	33.2	34.6	37.0	38.9	40.5	41.8	42.3	42.3	42.1	41.3	40.4	39.2	38.5	37.3	36.4	35.4	34.9	37.1
Philadelphia, Pa	34.9	34.6	34.3	34.2	34.0	33.8	33.8	34.1	34.9	36.1	37.4	38.5	39.1	39.7	39.9	39.5	38.6	37.9	36.9	36.8	36.2	35.6	35.2	34.8	36.3
Pittsburg, Pa	36.3	35.8	35.5	35.0	34.7	34.2	33.9	34.0	34.7	35.9	37.6	38.4	39.0	39.4	39.7	39.4	38.9	38.5	37.8	37.4	37.0	36.6	36.4	35.7	36.7
Portland, Oreg	38.6	38.5	37.7	37.5	37.4	37.3	37.4	37.4	37.2	37.2	37.1	37.9	38.9	40.3	41.1	41.8	42.1	41.8	41.1	40.6	40.2	39.6	39.3	38.6	39.0
Rapid City, S. Dak	26.1	25.3	26.0	26.3	25.6	26.7	26.4	25.0	23.9	25.9	30.4	35.9	39.0	40.4	40.4	40.3	39.3	35.9	31.7	29.4	26.9	25.7	25.5	25.8	30.2
Red Bluff, Cal	44.3	43.9	43.1	42.7	42.3	42.1	41.9	41.4	41.2	41.3	41.3	42.5	43.8	45.0	46.4	47.3	47.9	48.1	47.6	47.0	46.1	45.7	45.6	45.0	44.3
Rochester, N. Y	32.6	32.4	32.2	31.9	31.8	31.6	31.5	31.3	31.7	32.7	33.7	34.8	36.1	36.6	36.5	35.8	34.9	34.2	33.7	33.2	32.8	32.5	32.3	32.1	33.3
Roseburg, Oreg	36.2	35.7	35.5	35.4	35.3	35.0	35.0	35.1	34.9	34.9	34.8	35.1	35.9	36.8	37.6	38.5	38.9	39.3	39.3	38.8	37.9	37.2	36.7	36.5	36.5
St. Louis, Mo	37.9	37.5	37.2	36.8	36.4	35.9	35.6	35.4	35.4	36.0	37.7	39.4	41.0	42.1	42.9	43.2	42.9	41.9	41.0	40.0	39.4	38.7	37.9	37.3	38.6
St. Paul, Minn	26.6	26.4	26.0	25.4	24.9	24.4	23.9	23.9	23.7	24.0	25.2	26.7	28.6	29.7	30.9	31.3	31.1	30.4	29.5	28.6	28.1	27.5	27.0	26.7	27.1
Salt Lake City, Utah	32.6	28.6	28.3	27.9	27.9	27.5	27.5	27.8	27.5	27.5	28.9	31.2	32.8	34.7	35.4	36.0	36.2	36.0	34.6	33.3	31.7	30.3	30.1	29.8	30.9
San Diego, Cal	52.6	52.2	51.7	51.6	51.5	51.1	50.7	50.8	50.6	50.5	52.6	54.7	56.5	57.7	58.4	58.8	58.8	58.5	57.6	56.7	55.4	54.7	54.0	53.4	54.2
San Francisco, Cal	49.4	49.3	49.1	49.0	48.5	48.4	48.2	47.9	47.8	48.0	48.4	49.2	49.9	50.6	50.9	51.6	51.7	51.7	51.5	51.0	50.6	49.9	49.6	49.5	49.7
Santa Fe, N. Mex	30.8	30.3	30.5	30.2	29.6	29.1	28.3	28.3	27.7	28.7	31.6	34.1	35.9	37.7	38.9	40.2	40.1	39.0	36.1	33.7	32.4	31.8	31.3	31.0	32.8
Sault Ste. Marie, Mich	24.8	24.6	24.4	24.0	24.1	23.9	23.6	23.4	23.6	24.1	25.2	26.3	27.1	27.6	28.2	28.1	27.5	26.9	26.2	26.1	25.7	25.4	25.0	24.9	25.4
Savannah, Ga	49.8	49.1	48.3	47.9	47.4	46.8	46.8	46.9	49.0	52.9	56.3	58.5	59.9	60.8	61.0	60.4	58.9	56.2	54.8	53.7	52.8	51.8	51.0	49.9	53.0
Seattle, Wash	38.2	38.0	37.5	37.3	37.1	36.9	36.7	36.6	36.6	36.4	36.5	37.1	38.1	39.5	41.4	42.4	42.8	42.5	42.1	41.0	40.1	39.6	39.0	38.6	38.8
Shreveport, La	49.8	49.1	48.3	47.7	47.0	46.3	45.9	45.2	45.4	47.2	50.0	52.6	54.8	56.4	57.1	57.7	57.6	56.6	55.1	53.9	52.9	51.8	51.0	49.8	51.2
Spokane, Wash	31.0	30.5	29.8	29.9	29.4	29.1	28.9	28.7	28.3	28.4	28.3	28.9	30.3	31.7	32.9	33.6	34.5	34.8	33.7	33.1	32.3	32.0	31.4	31.1	30.9
Titusville, Fla	59.1	58.7	58.5	58.5	57.9	57.1	56.8	57.4	60.9	64.1	65.7	66.9	67.3	67.6	67.2	66.6	65.1	63.2	62.4	61.6	61.0	60.4	59.5	58.8	61.8
Toledo, Ohio	33.0	32.7	32.3	31.9	31.7	31.5	31.2	31.0	31.2	32.0	33.4	34.7	35.5	36.4	37.0	37.0	36.5	35.7	35.2	34.5	34.0	33.6	33.3	32.7	33.7
Tucson, Ariz	50.9	49.1	48.1	47.1	46.4	46.2	45.8	45.8	45.5	45.8	48.7	54.5	58.2	60.9	62.3	63.0	63.2	62.3	59.9	57.3	55.5	54.1	53.0	51.3	53.1
Vicksburg, Miss	49.4	48.7	48.0	47.5	46.9	46.1	46.1	46.0	46.4	48.2	50.5	53.1	55.7	56.8	57.9	58.7	58.2	56.5	54.9	53.2	52.3	50.7	50.3	49.5	51.3
Washington, D. C	34.7	34.0	33.9	33.0	32.5	32.2	31.9	32.4	34.3	37.1	39.3	41.0	42.3	43.2	43.5	43.2	42.2	40.5	38.9	37.5	36.7	35.9	35.3	34.5	37.1
Williston, N. Dak	15.6	15.1	14.5	13.9	13.5	13.5	13.3	13.7	13.5	13.4	14.4	17.2	20.7	23.2	24.7	25.6	25.2	23.0	20.8	19.1	17.5	16.5	15.5	15.0	17.4
Wilmington, N. C	46.3	45.6	45.0	44.5	44.0	43.5	43.2	42.9	44.6	46.3	48.7	50.6	52.7	53.3	53.7	53.4	52.3	50.7	49.5	48.8	47.9	47.5	47.1	46.7	47.9
Winnemucca, Nev	23.1	22.5	22.1	21.8	21.4	21.3	20.0	19.8	19.9	20.3	20.5	22.9	25.3	27.7	30.0	31.5	32.6	32.8	32.0	29.6	27.7	26.0	24.9	23.8	24.9
Yuma, Ariz	51.5	50.6	50.1	49.3	48.8	48.2	48.1	47.7	47.3	47.8	51.1	55.1	58.8	60.8	62.3	63.2	63.5	62.8	61.4	58.5	56.5	54.8	53.3	52.5	54.3

TABLE VI.—*Mean pressure for each hour of seventy-fifth meridian time, December*, 1894.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex	28.383	.377	.374	.375	.373	.370	.374	.381	.389	.396	.406	.407	.394	.366	.345	.333	.329	.332	.337	.347	.365	.378	.384	.389	.371
Albany, N. Y	30.053	.057	.050	.047	.044	.047	.053	.057	.064	.059	.042	.024	.006	.000	.006	.013	.022	.032	.042	.045	.047	.054	.054	.050	.040
Alpena, Mich	29.350	.350	.358	.356	.349	.349	.357	.355	.357	.359	.352	.330	.314	.301	.298	.305	.311	.317	.323	.325	.333	.337	.341	.342	.336
Atlanta, Ga	28.993	.993	.997	.994	.992	.995	.006	.017	.025	.040	.039	.024	.999	.978	.969	.968	.974	.980	.987	.990	.994	.998	.000	.995	.998
Augusta, Ga	30.010	.000	.006	.006	.005	.010	.015	.021	.030	.039	.035	.020	.995	.977	.969	.968	.971	.976	.985	.992	.001	.008	.013	.013	.003
Baltimore, Md	29.955	.955	.951	.944	.943	.944	.955	.962	.973	.977	.970	.949	.935	.925	.926	.931	.937	.945	.955	.960	.967	.968	.967	.958	.952
Bismarck, N. Dak	28.219	.213	.214	.217	.219	.216	.218	.221	.228	.238	.244	.243	.229	.211	.201	.194	.197	.206	.214	.219	.222	.221	.220	.220	.218
Boston, Mass	29.979	.984	.976	.969	.969	.976	.983	.988	.987	.989	.970	.953	.935	.935	.939	.945	.955	.961	.968	.969	.975	.976	.978	.972	.968
Buffalo, N. Y	29.326	.325	.330	.325	.319	.319	.323	.330	.335	.344	.340	.327	.312	.303	.304	.306	.311	.319	.327	.327	.328	.329	.329	.326	.323
Charleston, S. C	30.162	.158	.159	.156	.157	.162	.173	.182	.191	.200	.198	.175	.154	.133	.126	.125	.131	.139	.149	.159	.161	.163	.163	.161	.160
Chicago, Ill	29.189	.186	.193	.189	.183	.182	.188	.193	.198	.205	.213	.205	.185	.172	.166	.170	.173	.180	.183	.188	.187	.190	.190	.193	.188
Cincinnati, Ohio	29.474	.472	.473	.473	.468	.470	.480	.487	.497	.504	.503	.490	.468	.455	.447	.451	.459	.465	.474	.476	.478	.480	.485	.483	.476
Cleveland, Ohio	29.287	.289	.297	.295	.296	.299	.303	.302	.308	.315	.315	.299	.281	.270	.268	.271	.276	.286	.294	.298	.293	.290	.289	.288	.292
Columbus, Ohio	29.261	.259	.263	.261	.257	.262	.268	.272	.279	.285	.285	.270	.252	.239	.234	.235	.240	.245	.256	.261	.261	.262	.267	.266	.260
Denver, Colo	24.794	.785	.775	.775	.773	.765	.761	.762	.773	.785	.798	.806	.795	.777	.760	.751	.754	.758	.768	.778	.787	.792	.795	.795	.791
Des Moines, Iowa	29.184	.183	.190	.195	.195	.195	.195	.196	.199	.206	.213	.208	.188	.168	.156	.153	.152	.155	.160	.168	.173	.177	.181	.183	.182
Detroit, Mich	29.290	.288	.295	.295	.292	.290	.296	.304	.309	.314	.312	.296	.276	.264	.258	.262	.268	.275	.283	.288	.289	.287	.291	.290	.288
Dodge City, Kans	27.509	.503	.496	.500	.498	.494	.489	.495	.508	.516	.527	.532	.516	.485	.465	.455	.461	.464	.474	.482	.493	.502	.509	.510	.495
Duluth, Minn	29.267	.268	.272	.270	.264	.264	.266	.270	.271	.271	.262	.244	.234	.233	.240	.240	.245	.251	.261	.267	.272	.273	.268	.266	.268	.262
Eastport, Me	29.963	.966	.962	.959	.962	.969	.979	.993	.998	.992	.975	.956	.940	.935	.937	.939	.945	.955	.959	.958	.958	.955	.957	.955	.961
El Paso, Tex	26.311	.305	.297	.296	.297	.293	.295	.305	.320	.333	.337	.345	.336	.307	.284	.265	.261	.260	.263	.273	.287	.296	.304	.310	.299
Galveston, Tex	30.182	.178	.176	.177	.175	.176	.183	.195	.208	.221	.229	.220	.199	.171	.154	.148	.147	.149	.154	.160	.176	.185	.190	.193	.181
Grand Haven, Mich	29.367	.366	.373	.376	.363	.360	.361	.365	.370	.374	.379	.370	.353	.338	.331	.328	.340	.344	.350	.352	.352	.354	.357	.358	.358
Havre, Mont	27.355	.352	.352	.349	.352	.345	.343	.340	.346	.357	.370	.377	.376	.362	.344	.333	.329	.328	.330	.328	.335	.342	.344	.348	.347
Helena, Mont	25.839	.839	.835	.838	.845	.844	.842	.844	.848	.852	.862	.866	.859	.839	.828	.821	.818	.823	.828	.827	.830	.831	.834	.833	.838
Huron, S. Dak	28.656	.650	.649	.656	.651	.647	.645	.648	.642	.647	.658	.659	.645	.628	.618	.612	.617	.628	.639	.643	.644	.646	.653	.658	.643
Independence, Cal	26.066	.067	.059	.055	.055	.052	.049	.050	.062	.075	.084	.096	.097	.078	.047	.030	.022	.015	.012	.015	.028	.039	.050	.062	.053
Indianapolis, Ind	29.298	.297	.299	.301	.300	.302	.310	.314	.320	.326	.326	.313	.295	.281	.276	.278	.283	.285	.292	.295	.298	.300	.301	.298	.299
Jacksonville, Fla	30.142	.140	.138	.138	.137	.144	.157	.167	.180	.185	.177	.158	.129	.114	.105	.106	.113	.120	.131	.137	.143	.146	.151	.148	.142
Kansas City, Mo	29.134	.135	.136	.143	.139	.136	.141	.150	.156	.166	.175	.174	.154	.129	.109	.104	.107	.109	.115	.121	.128	.133	.134	.138	.136
Key West, Fla	30.128	.118	.111	.107	.108	.114	.125	.141	.156	.164	.161	.145	.120	.101	.093	.087	.093	.101	.108	.124	.133	.138	.137	.132	.123
Knoxville, Tenn	29.142	.140	.140	.137	.138	.139	.148	.155	.162	.172	.174	.158	.133	.113	.105	.109	.110	.118	.127	.135	.137	.140	.144	.143	.138
Little Rock, Ark	29.871	.864	.868	.870	.866	.869	.880	.894	.907	.923	.936	.931	.904	.879	.864	.856	.854	.857	.868	.876	.882	.884	.880	.882	.882
Louisville, Ky	29.586	.583	.585	.585	.581	.585	.592	.600	.608	.615	.618	.606	.584	.568	.560	.560	.565	.571	.578	.586	.587	.590	.593	.593	.587
Lynchburg, Va	29.427	.430	.428	.427	.427	.430	.440	.447	.456	.460	.453	.431	.405	.392	.388	.391	.395	.402	.413	.417	.421	.424	.425	.421	.423
Marquette, Mich	29.165	.163	.171	.165	.159	.154	.157	.158	.158	.160	.164	.153	.140	.131	.131	.140	.148	.156	.159	.163	.162	.163	.163	.163	.156
Memphis, Tenn	29.849	.841	.846	.849	.847	.851	.860	.876	.890	.903	.908	.901	.881	.861	.845	.841	.842	.841	.847	.854	.857	.858	.860	.858	.861
Milwaukee, Wis	29.318	.319	.326	.329	.323	.324	.328	.329	.331	.337	.343	.335	.319	.307	.303	.306	.311	.315	.315	.320	.320	.318	.316	.314	.321
Moorhead, Minn	28.985	.986	.986	.991	.990	.985	.990	.993	.994	.997	.998	.014	.999	.989	.976	.979	.985	.993	.996	.997	.996	.991	.988	.990	.992
Nantucket, Mass	30.103	.106	.107	.101	.098	.103	.109	.115	.117	.117	.103	.085	.074	.069	.070	.076	.081	.087	.097	.098	.098	.101	.100	.097	.096
Nashville, Tenn	29.592	.592	.598	.598	.594	.596	.606	.608	.616	.625	.631	.613	.589	.578	.570	.573	.577	.584	.589	.594	.595	.597	.599	.599	.597
New Haven, Conn	30.007	.006	.005	.998	.998	.999	.005	.013	.016	.014	.996	.975	.962	.955	.962	.969	.977	.987	.996	.004	.007	.011	.009	.002	.995
New Orleans, La	30.139	.136	.133	.131	.132	.133	.142	.153	.166	.180	.177	.163	.141	.117	.107	.106	.108	.114	.125	.138	.147	.151	.154	.148	.139
New York, N. Y	29.942	.941	.936	.928	.922	.924	.928	.935	.936	.940	.925	.910	.898	.895	.900	.906	.915	.927	.935	.942	.945	.947	.946	.940	.928
Norfolk, Va	30.096	.095	.094	.089	.091	.098	.110	.120	.133	.139	.129	.110	.085	.073	.069	.069	.075	.081	.090	.095	.098	.102	.103	.098	.098
Omaha, Neb	28.944	.943	.946	.951	.948	.944	.941	.940	.943	.942	.945	.944	.932	.914	.903	.898	.902	.905	.914	.922	.931	.933	.938	.944	.932
Parkersburg, W. Va	29.482	.483	.485	.484	.480	.485	.493	.501	.511	.519	.517	.502	.485	.474	.468	.468	.475	.475	.481	.482	.486	.488	.490	.489	.488
Philadelphia, Pa	30.028	.028	.024	.019	.016	.020	.024	.030	.040	.045	.036	.021	.008	.001	.003	.005	.010	.016	.027	.031	.035	.037	.035	.025	.023
Pittsburg, Pa	29.253	.252	.255	.255	.250	.251	.257	.262	.262	.267	.269	.256	.238	.224	.225	.229	.233	.237	.245	.251	.252	.251	.252	.253	.249
Portland, Oreg	29.847	.845	.842	.838	.839	.837	.831	.829	.831	.834	.844	.853	.862	.857	.841	.828	.819	.822	.826	.831	.838	.840	.842	.840	.838
Rochester, N. Y	29.506	.508	.511	.509	.505	.507	.509	.514	.519	.521	.517	.501	.488	.482	.483	.487	.489	.493	.494	.504	.503	.503	.505	.504	.503
Roseburg, Oreg	29.409	.411	.412	.408	.407	.405	.402	.396	.393	.394	.396	.405	.412	.413	.400	.390	.381	.383	.387	.388	.391	.394	.402	.405	.399
St. Louis, Mo	23.550	.544	.547	.549	.546	.546	.555	.566	.574	.584	.592	.585	.566	.548	.538	.537	.538	.543	.552	.560	.561	.562	.564	.562	.557
St. Paul, Minn	29.131	.128	.127	.132	.129	.128	.126	.132	.132	.137	.143	.143	.127	.113	.105	.108	.111	.116	.119	.127	.129	.130	.131	.131	.126
Salt Lake City, Utah	25.721	.726	.723	.721	.725	.728	.724	.727	.734	.738	.748	.755	.755	.737	.717	.703	.699	.700	.696	.699	.702	.708	.711	.715	.721
San Diego, Cal	29.993	.994	.991	.993	.990	.990	.982	.982	.987	.997	.007	.019	.025	.013	.988	.973	.964	.966	.965	.969	.976	.986	.993	.992	.989
San Francisco, Cal	29.910	.910	.909	.905	.906	.903	.893	.889	.891	.899	.906	.917	.931	.925	.908	.895	.888	.890	.887	.888	.891	.895	.905	.910	.902
Santa Fe, N. Mex	23.313	.309	.304	.302	.301	.297	.295	.295	.299	.306	.320	.333	.332	.314	.299	.289	.289	.290	.291	.297	.302	.303	.308	.310	.304
S't Ste. Marie, Mich	29.275	.273	.270	.267	.268	.269	.273	.277	.282	.283	.277	.260	.245	.238	.231	.245	.248	.252	.256	.258	.259	.264	.262	.260	.262
Savannah, Ga	30.098	.096	.095	.094	.093	.101	.111	.119	.129	.136	.126	.108	.081	.065	.054	.055	.059	.066	.075	.085	.089	.098	.101	.097	.093
Seattle, Wash	29.843	.848	.844	.844	.846	.847	.839	.834	.833	.839	.841	.848	.853	.846	.833	.818	.810	.810	.813	.814	.819	.826	.833	.836	.834
Spokane, Wash	28.026	.030	.024	.026	.031	.025	.021	.019	.023	.029	.038	.046	.052	.042	.028	.022	.017	.019	.018	.020	.020	.019	.020	.023	.027
Toledo, Ohio	29.366	.366	.370	.369	.368	.370	.380	.383	.390	.398	.395	.376	.359	.343	.336	.343	.347	.353	.359	.361	.362	.366	.367	.366	.366
Vicksburg, Miss	29.925	.921	.924	.922	.922	.926	.936	.951	.961	.970	.978	.966	.942	.916	.897	.893	.893	.895	.901	.908	.915	.923	.927	.928	.927
Washington, D. C	30.048	.044	.043	.037	.031	.036	.047	.058	.072	.083	.077	.058	.041	.030	.024	.027	.030	.035	.048	.054	.055	.059	.059	.049	.048
Wilmington, N. C	30.086	.088	.090	.087	.091	.102	.114	.120	.129	.132	.115	.093	.073	.061	.059	.062	.069	.075	.081	.086	.087	.091	.089	.084	.090
Yuma, Aris	29.938	.941	.934	.932	.934	.933	.932	.933	.943	.954	.970	.980	.978	.961	.931	.915	.908	.906	.903	.908	.915	.923	.928	.935	.935

TABLE VII.—*Average wind movement for each hour of seventy-fifth meridian time, December, 1894.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex	9.1	8.7	9.0	8.4	9.0	8.7	8.4	8.5	8.9	8.7	10.3	11.5	12.2	12.4	12.5	12.5	12.5	11.8	10.4	8.9	8.6	8.3	8.6	8.7	9.9
Albany, N. Y	6.2	6.4	6.3	6.3	5.5	5.7	5.8	6.7	6.9	7.6	8.1	9.0	9.8	9.8	9.8	9.0	8.1	8.0	8.1	7.7	6.8	6.6	6.8	6.5	7.4
Alpena, Mich	10.2	9.8	9.3	9.8	10.2	9.9	9.7	9.2	9.5	9.8	10.8	11.5	11.7	11.7	11.7	11.5	11.0	11.1	10.9	11.0	10.5	10.9	10.4	10.6	10.5
Amarillo, Tex	15.9	15.6	15.2	15.2	15.2	16.3	15.6	15.7	14.6	15.3	17.3	19.8	21.3	21.5	21.6	21.8	22.0	19.8	16.5	15.7	15.3	16.1	16.4	16.4	17.3
Atlanta, Ga	10.5	10.6	10.0	10.7	10.2	10.2	10.0	9.5	9.4	9.2	9.8	10.5	10.0	10.6	10.5	10.3	10.0	9.5	9.4	10.1	10.1	10.5	11.0	10.7	10.1
Atlantic City, N. J	10.6	10.6	10.7	10.4	10.1	9.7	9.5	9.4	10.6	12.0	12.9	13.5	13.4	14.0	14.7	13.9	12.3	11.8	11.3	11.8	12.0	12.1	12.0	11.7	11.7
Augusta, Ga	3.5	3.2	3.7	4.0	4.2	4.0	3.9	3.9	4.0	4.2	4.7	5.5	6.1	6.1	6.4	6.0	5.7	4.4	4.0	4.1	3.9	4.2	3.4	3.6	4.4
Baker City, Oreg	5.7	6.4	6.0	6.2	6.1	5.5	6.0	5.7	5.6	6.2	6.3	5.6	6.4	6.4	6.0	6.1	6.4	6.3	5.3	4.4	4.7	5.5	5.7	6.0	5.8
Baltimore, Md	5.8	5.4	5.1	5.4	5.2	5.1	5.6	5.6	6.6	7.8	8.5	8.4	8.5	8.7	9.1	8.7	7.5	6.7	7.1	6.5	6.8	6.6	6.3	6.2	6.8
Bismarck, N. Dak	7.0	7.1	7.9	7.5	8.0	8.0	7.2	6.7	6.8	6.7	6.5	7.7	9.6	10.8	11.3	11.6	10.8	7.8	6.6	6.3	6.8	6.1	6.5	7.2	7.9
Block Island, R. I	18.3	18.5	18.1	17.8	17.2	17.2	16.3	16.7	16.6	16.7	17.0	16.8	17.1	17.6	17.3	17.1	16.5	16.0	16.7	17.8	18.0	18.2	18.2	18.7	17.3
Boston, Mass	12.5	11.5	12.1	12.1	11.2	11.2	10.6	10.3	10.8	10.5	10.7	10.9	11.1	11.5	12.3	11.6	11.2	10.8	11.1	11.4	11.5	11.6	11.9	12.6	11.4
Buffalo, N. Y	14.5	14.5	13.8	13.8	14.3	14.1	13.5	13.0	13.7	14.0	14.9	16.7	16.6	16.7	17.3	17.5	16.7	16.2	16.3	16.4	15.4	15.6	15.9	15.6	15.3
Cairo, Ill	8.0	8.3	8.3	8.9	9.0	8.5	7.9	8.9	9.0	8.9	9.5	9.6	9.6	10.2	10.3	9.9	9.0	9.1	8.6	8.3	8.6	8.3	8.0	7.8	8.8
Cape Henry, Va	13.5	14.1	14.5	13.7	14.0	14.4	13.5	13.5	14.0	13.6	14.1	13.9	14.4	13.8	13.3	12.4	11.4	11.5	11.2	11.9	13.2	13.6	15.2	15.2	13.5
Charleston, S. C	6.3	6.5	6.4	6.8	6.9	6.4	6.5	6.6	7.1	7.6	7.9	8.0	8.6	8.9	8.8	8.2	7.8	6.0	5.6	5.9	5.7	5.6	6.1	6.4	6.9
Charlotte, N. C	5.9	6.3	6.3	6.4	6.4	5.8	6.3	6.7	7.1	7.7	7.8	8.3	8.6	9.0	8.2	8.0	6.3	5.4	5.4	5.7	6.4	6.4	6.9	6.3	6.8
Chattanooga, Tenn	6.2	5.7	5.5	5.7	5.5	5.6	5.6	6.2	6.5	7.4	7.7	8.4	7.4	7.3	7.6	8.5	8.2	7.7	7.1	7.0	6.0	6.4	6.0	6.1	6.7
Cheyenne, Wyo	8.8	8.7	8.6	9.0	10.7	10.6	11.3	11.1	10.7	10.5	11.2	13.0	13.3	14.2	14.5	14.2	14.2	11.6	9.2	10.1	9.6	9.3	8.4	9.9	11.0
Chicago, Ill	18.1	17.7	17.9	18.1	18.6	18.5	19.2	19.5	19.2	19.3	18.5	18.4	19.6	19.8	19.8	20.0	19.1	19.2	19.3	19.4	19.8	19.3	19.4	18.6	19.0
Cincinnati, Ohio	6.5	7.1	6.9	7.2	7.1	7.1	7.3	8.1	8.5	8.9	9.5	9.5	10.0	10.3	9.7	9.5	9.3	8.1	8.1	7.8	7.9	7.5	7.0	6.9	8.2
Cleveland, Ohio	14.5	14.9	15.3	15.6	15.7	15.4	14.9	15.1	15.0	16.3	16.5	17.2	17.6	16.9	16.4	16.0	15.6	15.2	15.0	14.8	14.7	14.3	14.8	14.9	15.5
Columbia, Mo	7.5	7.1	7.5	6.5	6.7	6.8	6.7	6.6	6.9	7.2	8.3	9.0	9.4	10.2	10.3	10.7	10.1	8.3	7.5	8.0	8.1	8.0	8.1	7.8	8.1
Columbus, Ohio	6.1	6.2	6.3	6.6	7.0	6.7	6.6	7.0	7.4	7.7	8.6	8.5	8.8	9.0	8.4	8.2	7.6	7.4	7.1	6.7	6.6	6.5	6.3	6.1	7.2
Concordia, Kans	7.2	7.7	7.3	7.2	7.7	7.3	7.5	6.9	6.8	8.6	10.5	11.1	11.0	11.4	11.3	10.8	9.5	7.9	6.1	6.0	6.5	6.6	6.6	6.7	8.2
Corpus Christi, Tex	8.3	8.5	9.1	9.3	9.1	9.1	9.1	8.9	9.1	9.5	10.5	11.2	11.8	11.5	12.1	12.4	13.0	12.8	12.1	11.1	10.9	10.5	10.0	9.0	10.4
Davenport, Iowa	9.3	9.3	8.9	8.9	8.9	8.6	8.6	8.0	8.2	9.1	10.0	11.1	11.4	12.2	12.7	13.1	12.6	10.9	10.3	10.2	9.9	9.7	10.0	9.7	10.1
Denver, Colo	7.0	6.5	6.1	5.5	5.5	6.5	6.2	5.9	6.3	7.3	6.5	6.7	7.9	8.5	9.0	8.6	8.6	8.8	7.2	6.0	5.6	6.1	6.8	6.6	6.9
Des Moines, Iowa	8.1	8.1	7.8	7.6	7.3	7.0	6.8	6.8	6.8	7.3	8.7	9.4	10.0	10.3	10.8	10.8	10.5	9.8	8.8	8.2	8.5	8.7	9.1	8.7	8.6
Detroit, Mich	10.6	10.8	11.4	11.8	11.4	12.6	12.7	12.4	12.7	13.4	13.8	14.4	14.3	15.1	15.2	14.5	13.3	12.4	11.5	12.1	12.2	12.6	12.4	12.0	12.7
Dodge City, Kans	10.1	10.2	10.5	10.8	10.5	10.2	10.1	9.7	9.5	9.7	11.1	12.3	13.7	15.2	14.4	13.5	13.0	11.0	8.7	8.6	9.1	9.2	9.4	9.5	10.8
Duluth, Minn	6.3	6.6	6.2	6.0	5.7	5.7	6.0	6.1	6.1	6.2	6.7	6.8	7.2	7.0	7.3	7.4	7.3	6.7	6.5	5.7	6.0	6.8	7.0	6.4	6.5
Eastport, Me	12.9	13.1	12.9	13.3	12.9	13.5	12.9	12.5	12.2	12.4	12.2	12.2	11.9	11.9	12.0	11.7	11.2	11.5	11.0	11.6	12.6	12.8	13.5	13.9	12.4
El Paso, Tex	11.3	11.2	11.8	11.2	10.7	10.7	10.6	10.3	10.2	9.6	9.6	11.2	12.8	13.4	13.7	14.1	13.6	13.0	12.2	10.1	9.5	9.5	10.2	10.5	11.3
Erie, Pa	13.9	13.7	13.6	13.7	13.5	13.4	13.5	13.5	14.3	14.6	15.0	14.3	14.0	14.1	13.7	13.7	13.7	14.3	14.6	14.4	14.4	14.1	14.0	14.0	14.0
Eureka, Cal	7.6	7.0	6.4	6.6	6.3	6.6	6.2	6.6	6.8	6.9	6.6	6.2	6.0	6.3	7.1	8.2	8.2	8.4	8.0	7.0	6.3	6.7	7.4	7.6	7.0
Fort Canby, Wash	19.5	19.6	19.5	18.7	18.7	17.3	16.4	16.5	17.4	18.7	17.6	16.9	19.0	20.5	21.6	21.0	20.9	21.4	20.2	17.9	17.3	17.5	18.6	18.8	18.8
Fort Smith, Ark	5.2	5.5	5.4	5.4	5.5	5.6	5.7	6.3	5.8	6.7	7.5	7.4	7.4	8.2	7.9	8.0	7.8	6.9	6.2	6.5	5.7	5.8	5.4	5.2	6.4
Fresno, Cal	4.5	5.1	5.2	5.3	5.1	5.3	4.9	4.3	4.3	4.5	4.8	4.8	5.0	5.4	6.3	5.9	6.0	5.6	4.7	4.2	4.2	4.4	4.7	4.8	5.0
Galveston, Tex	10.9	11.3	11.4	11.6	12.5	11.7	11.5	12.0	11.5	11.4	11.7	11.3	10.8	11.0	11.2	10.6	10.3	10.0	10.1	10.5	10.9	11.1	11.3	11.3	11.2
Grand Haven, Mich	12.5	12.0	12.2	12.5	12.5	12.7	12.5	12.5	13.0	13.4	14.0	13.9	14.1	14.2	13.8	14.0	13.5	13.3	13.3	12.9	13.8	13.8	13.4	12.8	13.2
Green Bay, Wis	10.5	10.3	9.8	9.7	9.3	9.8	9.3	9.4	8.8	9.3	10.8	11.8	12.0	11.9	11.7	11.0	10.1	9.4	8.7	8.9	9.4	9.7	10.1	10.2	10.1
Hannibal, Mo	9.7	9.5	9.5	9.8	9.5	9.4	9.3	9.2	9.8	10.1	10.9	11.1	11.6	12.9	12.9	13.0	12.5	10.7	9.7	9.7	10.2	10.3	10.0	10.2	10.5
Harrisburg, Pa	6.6	7.0	6.9	6.4	6.2	5.9	6.1	6.6	7.3	8.0	8.5	8.4	9.7	9.4	8.8	8.4	8.2	7.9	7.5	8.0	8.1	8.0	7.5	6.8	7.6
Hatteras, N. C	16.5	17.0	17.2	17.2	16.4	16.0	16.3	16.7	15.9	15.2	14.5	13.9	13.3	14.0	14.7	14.9	14.8	14.7	14.8	14.9	14.8	15.2	16.0	16.3	15.5
Havre, Mont	7.9	8.1	8.4	9.2	8.4	8.6	8.6	8.0	7.5	7.5	7.7	8.4	10.0	11.0	10.9	10.9	10.3	9.2	8.1	7.5	7.4	7.8	8.5	8.9	8.7
Helena, Mont	5.6	4.9	4.5	5.0	5.3	5.0	4.7	4.7	4.7	4.3	3.9	4.9	5.4	6.2	6.5	6.0	5.5	5.2	5.9	5.9	5.7	5.8	5.8	5.3	5.3
Huron, S. Dak	12.9	12.8	12.6	12.0	12.3	12.6	12.7	12.7	12.0	12.3	13.1	14.4	14.9	14.9	14.6	14.8	14.1	11.9	11.8	11.9	13.0	12.6	13.0	12.7	13.0
Idaho Falls, Idaho	6.7	6.9	6.6	6.6	6.9	6.9	6.9	7.0	7.3	7.6	6.9	6.5	6.9	6.7	6.8	6.9	6.8	6.4	6.1	5.8	6.5	6.1	6.9	6.8	6.7
Independence, Cal	6.5	6.8	6.4	7.0	6.9	7.9	7.7	7.1	7.6	7.3	6.6	7.1	7.8	8.1	9.1	9.5	10.1	9.1	8.3	8.0	7.8	6.1	6.4	5.8	7.5
Indianapolis, Ind	7.5	7.6	7.6	7.3	7.1	7.2	6.7	7.4	7.5	7.8	8.1	7.8	8.1	7.9	7.9	8.0	7.5	7.3	7.1	7.4	7.5	7.9	7.6	7.7	7.6
Jacksonville, Fla	5.3	5.4	4.6	5.2	5.7	6.0	5.7	5.8	6.3	7.1	7.5	8.4	9.0	9.5	9.9	9.0	8.5	7.4	6.0	5.8	5.3	5.1	5.1	5.3	6.6
Jupiter, Fla	9.4	9.7	9.6	9.3	9.5	8.7	9.1	9.0	9.8	11.2	12.0	12.5	12.8	13.1	12.7	12.6	11.8	10.4	9.7	9.9	9.9	10.4	10.2	9.4	10.5
Kansas City, Mo	9.9	9.5	9.3	8.5	8.6	8.1	8.5	8.9	9.2	9.4	10.1	10.8	11.6	11.6	11.8	12.0	11.6	10.4	10.2	10.7	10.3	10.8	10.8	10.4	10.1
Keokuk, Iowa	8.6	8.9	8.3	7.9	7.8	8.3	7.8	7.8	8.1	8.2	8.8	9.8	9.7	10.5	11.1	11.2	10.3	9.1	8.5	8.5	8.7	8.5	8.1	7.9	8.9
Key West, Fla	12.5	13.2	12.7	12.5	12.3	12.6	12.6	12.6	12.0	12.3	12.9	13.2	12.8	13.5	13.3	13.3	13.0	12.4	12.0	13.1	13.3	13.1	12.8	12.6	12.8
Kittyhawk, N. C	17.6	17.2	17.9	18.0	17.8	18.1	17.6	17.3	17.2	17.0	16.8	16.8	17.2	17.2	16.9	16.7	15.5	14.7	14.1	13.5	14.0	15.6	16.9	17.7	16.6
Knoxville, Tenn	4.5	4.2	4.2	4.0	4.8	4.4	4.5	4.3	4.4	5.1	5.9	5.6	6.2	6.2	5.9	6.3	6.1	5.6	4.8	4.0	4.5	4.3	4.1	4.6	4.9
La Crosse, Wis	8.5	8.4	7.8	8.1	7.4	7.3	7.7	7.9	7.4	7.9	8.7	8.7	9.2	9.2	9.6	9.7	9.2	8.2	8.7	8.9	8.5	8.5	8.6	8.9	8.5
Lander, Wyo	2.7	3.3	4.0	3.7	3.0	2.5	2.3	2.4	3.0	3.1	3.0	3.5	4.3	4.7	4.9	5.4	4.5	4.2	3.2	3.2	2.8	2.7	2.7	3.1	3.4
Lexington, Ky	12.4	13.8	13.4	13.7	13.6	13.1	13.6	14.4	13.9	14.4	14.2	14.5	13.9	14.4	15.6	13.8	11.7	11.0	10.6	11.1	12.6	12.6	13.0	12.8	13.3
Little Rock, Ark	5.5	5.3	6.0	6.4	5.6	5.8	6.6	6.3	6.6	7.4	9.0	8.8	8.8	8.6	8.6	8.6	8.0	7.8	6.7	6.1	5.5	5.6	5.8	6.0	6.9
Los Angeles, Cal	2.5	2.8	2.6	2.6	3.0	2.8	3.0	3.4	3.4	4.2	4.1	4.4	4.5	4.7	4.6	4.6	5.0	5.4	4.8	4.0	3.0	2.6	2.0	1.8	3.6
Louisville, Ky	7.4	7.5	7.2	8.0	8.1	7.8	7.9	8.5	8.7	8.5	8.7	9.1	9.4	9.5	10.2	9.7	9.4	8.3	7.6	7.9	8.2	8.5	8.2	7.5	8.4
Lynchburg, Va	3.5	3.3	3.4	3.6	3.5	3.4	3.1	3.4	4.3	4.6	5.3	5.5	6.4	6.5	6.3	5.5	4.8	4.1	4.3	4.4	4.2	3.6	3.3	3.6	4.3
Marquette, Mich	11.2	11.5	10.4	10.4	11.3	10.9	10.7	10.3	10.6	10.4	10.2	10.7	11.0	10.9	11.3	10.6	10.4	9.8	10.3	10.4	11.3	11.1	12.5	12.6	10.9
Memphis, Tenn	7.1	7.1	6.8	7.4	7.4	6.9	7.5	7.3	6.9	7.7	8.6	8.4	8.6	8.4	8.1	8.1	7.5	6.9	6.8	6.5	6.6	6.6	6.8	7.1	7.4
Meridian, Miss	5.0	5.0	4.7	4.4	4.0	4.1	4.6	4.7	5.3	6.6	7.5	7.8	8.2	7.8	7.8	7.2	7.3	5.6	4.7	4.9	5.1	4.6	5.2	5.2	5.7
Miles City, Mont	3.9	3.7	3.5	3.7	3.5	3.7	4.3	4.3	4.4	4.0	4.2	4.0	5.8	7.0	7.3	7.5	7.0	6.5	6.1	4.9	4.5	4.3	4.3	3.5	4.8
Milwaukee, Wis	11.2	11.3	11.3	11.1	11.1	11.0	10.9	10.5	11.3	11.6	12.5	13.1	13.4	13.4	13.4	13.2	12.3	11.5	11.6	11.3	12.2	11.8	11.6	11.1	11.8
Mobile, Ala	6.7	6.7	6.9	7.5	7.5	7.5	7.0	7.7	8.2	8.5	8.7	9.2	10.0	10.7	10.8	10.7	10.5	9.5	8.1	8.2	8.3	7.2	6.7	7.2	8.3
Montgomery, Ala	4.6	4.8	5.2	6.1	5.7	5.3	5.5	4.9	5.0	5.8	6.5	6.8	6.9	7.3	8.0	7.6	7.2	6.5	5.9	6.1	6.2	6.1	5.6	5.0	6.0
Moorhead, Minn	10.0	9.7	8.9	8.8	9.0	9.3	9.4	10.6	11.4	11.6	11.9	12.7	13.0	13.0	12.9	12.3	11.3	10.0	10.0	9.7	9.7	10.2	9.9	10.0	10.6
Nantucket, Mass	14.1	13.9	13.4	12.9	12.4	11.9	11.0	10.7	10.9	11.5	12.2	11.4	12.0	11.8	11.4	10.9	10.8	11.2	11.6	12.1	12.8	12.6	13.4	13.6	12.1
Nashville, Tenn	6.2	5.9	6.0	5.7	5.6	5.5	5.0	5.4	5.6	6.7	7.0	7.5	7.5	7.9	8.3	8.0	7.3	6.4	6.3	6.2	6.5	6.1	6.0	6.4	6.5
New Haven, Conn	9.2	9.5	9.4	9.4	9.3	9.7	9.3	9.1	8.5	9.3	9.7	10.3	10.3	11.2	11.5	10.7	10.0	9.1	9.0	8.9	9.2	9.1	9.0	8.8	9.5
New London, Conn	7.6	7.4	7.6	6.9	7.4	6.9	6.4	6.8	7.4	7.5	8.3	8.0	9.2	9.9	9.8	8.9	7.9	7.1	7.0	6.4	6.7	6.7	7.1	7.0	7.6
New Orleans, La	8.2	8.4	7.8	8.3	8.5	8.3	8.1	8.2	9.3	9.1	9.6	9.6	9.6	10.4	10.5	10.5	9.7	8.2	7.5	8.1	8.4	8.4	8.2	8.2	8.8
New York, N. Y	10.6	10.8	10.6	10.6	10.4	9.8	9.2	10.0	10.0	10.8	10.2	9.9	10.8	10.9	11.4	11.9	11.9	11.2	10.7	11.6	11.5	11.7	12.2	11.2	10.8
Norfolk, Va	8.4	7.9	8.6	8.9	8.3	8.2	8.6	8.1	8.1	9.0	9.4	9.6	10.5	9.7	9.1	8.6	7.7	6.9	8.2	7.4	7.3	8.2	8.4	8.2	8.5
Northfield, Vt	8.1	7.8	7.2	7.7	7.1	6.4	6.5	7.1	7.4	7.5	8.2	10.5	10.7	10.5	10.7	9.8	8.7	8.5	8.5	8.2	8.3	7.9	8.3	7.9	8.3
North Platte, Nebr	7.4	7.6	7.2	6.3	6.2	6.4	6.3	6.9	7.1	7.2	7.3	8.1	9.6	10.1	10.3	10.4	9.9	8.4	8.3	8.8	7.9	8.0	8.0	7.8	8.0
Oklahoma, Okla	8.6	8.7	8.8	8.6	9.0	9.1	9.0	8.9	9.3	10.1	11.4	11.3	11.5	12.4	12.4	12.5	12.2	10.7	8.8	8.6	8.5	8.3	7.8	8.4	9.8
Omaha, Nebr	6.8	6.7	7.0	6.5	6.9	6.6	6.8	7.0	7.1	7.5	8.3	8.6	9.5	9.7	9.9	9.4	9.3	8.0	7.4	7.3	7.7	7.2	6.8	6.9	7.7
Oswego, N. Y	13.0	13.3	13.2	12.6	13.1	13.3	12.8	14.0	14.3	14.4	14.8	14.4	15.0	15.2	14.4	12.8	12.5	12.6	12.4	13.8	13.3	13.4	13.7	13.9	13.6

TABLE VII.—*Average wind movement, etc.*—Continued.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Palestine, Tex	6.2	6.2	6.1	5.9	5.8	5.7	6.0	5.7	5.7	6.4	7.2	7.6	7.6	7.8	7.8	7.7	7.7	6.6	5.0	4.7	5.1	5.2	5.4	5.7	6.3
Parkersburg, W. Va	4.5	4.6	4.6	4.2	4.5	4.4	4.9	5.5	5.8	6.0	6.9	6.9	7.4	7.8	8.0	7.8	6.6	6.1	5.8	5.9	5.3	4.7	4.9	4.7	5.7
Pensacola, Fla	8.8	8.1	8.6	9.2	9.2	9.2	9.2	9.2	9.1	10.3	11.0	10.6	10.4	10.0	10.6	10.3	10.0	8.7	7.4	7.6	9.3	9.5	9.5	8.9	9.4
Philadelphia, Pa	9.1	9.1	9.1	8.6	8.5	8.3	8.5	9.6	9.5	10.0	10.9	10.9	11.4	12.0	11.9	11.4	10.9	10.5	10.9	10.6	9.9	9.9	10.3	10.1	10.1
Pierre, S. Dak	5.5	5.6	6.1	5.6	5.8	5.3	5.7	6.0	6.0	5.8	6.7	7.1	7.3	9.3	10.2	9.5	9.7	8.8	7.8	8.1	7.2	7.1	6.4	6.0	7.0
Pittsburg, Pa	6.1	5.7	5.7	5.4	5.1	5.5	5.9	6.0	7.0	7.9	8.0	7.8	8.7	8.4	8.4	8.6	7.9	7.1	6.8	6.6	7.0	6.3	6.5	6.5	6.9
Port Angeles, Wash	5.4	5.1	5.2	5.3	5.5	6.2	6.0	5.1	4.8	4.9	4.9	4.3	4.2	4.0	4.6	5.0	5.3	5.2	5.0	5.3	5.3	5.5	5.3	5.5	5.1
Port Huron, Mich	11.6	11.9	11.9	11.9	12.5	13.0	13.6	13.6	13.4	13.9	15.0	14.8	15.2	15.4	15.3	14.4	14.1	13.4	13.3	13.6	14.0	13.6	13.3	13.0	13.6
Portland, Me	7.5	7.7	8.3	7.8	8.2	7.7	7.8	7.2	7.3	7.3	7.0	7.5	8.1	8.5	7.7	7.8	7.7	7.4	8.0	8.0	7.5	7.2	7.5	7.2	7.7
Portland, Oreg	9.4	9.5	9.8	9.3	9.6	9.8	10.3	10.5	11.6	11.4	10.9	10.4	11.8	12.7	12.3	12.8	13.3	12.7	11.6	10.4	9.3	9.2	9.9	10.4	10.8
Pueblo, Colo	5.7	5.0	5.8	5.2	5.9	5.6	5.9	5.0	4.9	5.1	6.1	6.5	7.5	8.5	8.8	10.2	10.3	9.5	8.3	7.3	6.5	6.4	6.1	5.7	6.7
Raleigh, N. C	6.3	6.2	6.4	6.4	6.1	5.9	5.6	6.0	6.4	7.7	8.4	8.6	8.9	8.0	7.9	7.8	6.1	5.1	5.0	4.5	4.9	5.4	5.6	6.0	6.5
Rapid City, S. Dak	8.2	7.6	7.0	8.0	7.7	8.2	8.0	7.6	7.7	6.6	7.0	6.1	7.3	8.8	11.4	12.4	11.6	10.0	7.8	7.4	8.3	7.6	8.8	8.6	8.3
Red Bluff, Cal	8.5	7.9	7.7	7.2	7.5	8.0	8.3	8.7	8.1	8.5	8.3	8.4	8.9	9.9	10.3	10.6	10.2	9.8	9.9	9.5	8.6	8.8	8.9	8.5	8.8
Rochester, N. Y	9.7	9.4	9.3	9.1	8.9	8.7	8.5	9.0	9.5	9.7	10.8	10.6	11.4	11.4	11.2	11.5	10.0	10.0	9.8	9.1	9.2	9.6	9.9	9.6	9.8
Roseburg, Oreg	2.4	2.7	2.3	2.7	2.5	3.0	2.1	2.6	2.5	2.6	2.3	2.5	2.6	3.1	3.4	3.6	3.4	4.0	3.5	3.2	2.8	2.5	2.2	1.9	2.8
Sacramento, Cal	10.8	10.8	10.6	10.0	10.7	10.7	10.8	12.1	11.8	11.8	11.1	11.5	11.5	12.2	12.2	11.8	11.1	10.6	9.9	10.2	10.5	10.6	10.8	10.7	11.0
St. Louis, Mo	12.5	12.8	12.3	11.4	11.2	11.1	12.0	12.0	11.4	11.6	11.6	11.9	12.7	12.9	13.9	13.3	13.6	12.6	12.1	12.7	13.3	12.5	12.5	12.7	12.4
St. Paul, Minn	6.9	6.7	5.9	6.8	7.2	7.8	7.9	7.9	7.9	8.0	8.4	8.9	8.2	9.7	9.9	10.2	9.5	8.6	7.9	7.8	8.8	8.4	8.2	7.4	8.2
St. Vincent, Minn	7.0	7.2	7.4	7.3	7.9	8.1	8.6	9.0	8.9	8.7	9.5	10.3	10.7	11.2	10.7	10.2	9.3	7.8	7.3	7.4	7.2	7.0	7.0	6.9	8.4
Salt Lake City, Utah	4.8	4.9	4.4	3.7	4.4	4.7	4.8	4.8	3.7	4.3	4.5	5.7	7.4	8.0	7.8	8.5	8.7	8.3	6.9	5.4	4.1	4.3	4.5	4.7	5.6
San Antonio, Tex	4.9	5.3	4.7	5.2	5.3	4.9	5.2	5.1	4.3	5.0	6.1	6.8	7.7	7.4	6.9	7.1	7.2	7.0	6.9	6.2	6.1	5.9	6.4	5.8	6.0
San Diego, Cal	3.7	3.8	3.5	3.1	3.1	3.4	3.4	3.5	3.4	3.5	3.3	2.6	3.5	4.5	5.9	6.7	6.8	6.5	6.1	5.4	4.6	4.4	4.1	4.1	4.3
Sandusky, Ohio	9.9	9.3	9.2	9.3	9.4	8.8	9.6	10.2	10.5	10.7	11.5	11.5	11.0	11.1	10.6	11.0	10.4	9.6	10.0	9.7	9.8	10.0	10.0	9.5	10.1
San Francisco, Cal	7.4	8.4	8.1	8.3	8.7	8.3	8.6	8.8	9.4	9.9	9.8	9.8	10.0	9.4	9.4	10.1	10.6	10.1	9.3	9.1	8.4	8.6	8.5	7.3	9.0
San Luis Obispo, Cal	5.0	5.1	5.0	5.2	4.6	5.0	5.1	4.4	4.4	5.5	5.6	5.3	6.3	7.9	8.7	8.5	8.7	8.2	7.5	7.6	5.9	4.5	5.7	5.6	6.0
Santa Fe, N. Mex	4.5	3.5	3.6	4.4	4.8	3.9	4.8	5.0	5.3	5.4	5.4	7.0	7.5	8.2	8.7	8.5	8.7	8.5	6.4	5.3	4.5	4.3	4.5	4.6	5.7
Sault Ste. Marie, Mich.	9.1	9.0	8.6	8.4	7.9	7.7	7.5	7.7	7.5	7.8	8.1	8.3	8.5	8.9	9.8	10.4	10.6	11.0	10.3	10.4	10.6	10.5	10.1	9.9	9.1
Savannah, Ga	7.3	7.0	7.3	6.9	6.9	6.7	7.2	6.9	7.4	7.6	8.3	9.4	9.6	9.5	9.6	9.3	8.6	7.8	7.0	6.9	7.3	7.3	7.1	7.4	7.8
Seattle, Wash	6.0	6.3	5.3	5.2	5.6	5.6	5.3	4.9	5.4	5.1	5.2	6.0	5.7	6.3	6.1	6.6	6.8	7.3	6.9	7.1	7.1	6.3	6.2	6.0	6.0
Shreveport, La	6.7	6.3	6.3	6.1	6.3	6.2	6.0	6.0	6.1	6.5	7.3	7.3	7.0	7.0	7.1	7.2	7.5	7.2	6.7	6.5	6.7	7.1	6.8	6.8	6.7
Sioux City, Iowa	7.7	8.4	8.5	9.3	9.4	9.6	9.3	9.6	9.7	10.7	11.2	12.3	12.8	13.3	13.1	13.7	13.0	12.2	9.0	8.7	8.1	8.4	9.2	8.2	10.2
Spokane, Wash	5.2	5.6	5.5	5.4	4.9	5.3	5.1	4.9	5.0	5.4	5.5	5.6	6.2	6.8	6.9	7.1	6.9	6.5	5.9	5.5	4.9	5.1	5.7	6.2	5.7
Springfield, Ill	10.5	10.3	10.1	10.0	9.8	9.6	9.5	10.0	10.2	10.8	11.2	11.5	12.0	12.1	12.3	12.4	11.3	10.0	9.5	10.1	11.1	11.3	11.2	10.5	10.7
Springfield, Mo	10.9	10.8	11.0	10.2	10.3	10.5	10.0	9.8	9.3	9.4	10.3	11.0	11.6	12.3	12.5	12.3	12.1	10.6	9.8	10.5	10.6	10.5	10.5	10.7	10.7
Tampa, Fla	5.0	5.1	5.4	4.8	5.0	4.8	4.7	5.2	5.7	6.4	6.6	7.4	7.3	7.3	7.3	7.3	6.6	5.5	4.9	4.6	4.9	4.9	4.6	4.8	5.7
Tatoosh Island, Wash	18.3	19.5	20.2	20.4	21.6	21.9	20.4	21.9	22.0	22.5	23.0	23.6	22.2	22.1	20.4	20.4	20.3	20.2	18.1	19.2	19.2	20.4	20.4	19.0	20.7
Titusville, Fla	9.6	10.0	9.6	9.9	10.0	8.7	9.1	8.9	9.4	10.5	13.0	13.6	15.2	15.2	15.8	15.7	14.9	13.2	12.3	11.4	10.2	10.9	10.2	9.2	11.5
Toledo, Ohio	10.3	9.8	10.4	10.8	10.4	10.5	11.2	11.1	11.5	12.2	13.0	12.9	12.8	13.1	13.7	13.5	12.5	11.5	10.6	11.1	11.3	12.1	11.8	11.5	11.6
Tucson, Ariz	3.8	3.5	3.3	4.3	3.7	3.6	3.4	3.3	3.3	3.6	3.5	3.6	4.5	5.1	5.0	5.3	5.3	5.0	4.1	3.5	3.3	3.6	3.6	3.2	3.9
Valentine, Nebr	8.1	7.7	7.6	7.4	7.2	7.3	7.4	8.1	7.3	7.7	8.1	9.1	11.2	13.3	14.6	15.4	14.3	12.5	9.7	8.8	8.3	7.9	7.5	7.3	9.3
Vicksburg, Miss	6.8	7.2	6.9	6.9	7.2	6.7	6.4	6.4	6.3	6.7	7.1	7.3	7.1	7.3	7.4	7.4	7.5	6.9	6.5	6.5	6.4	7.0	6.5	6.2	6.8
Vineyard Haven, Mass	10.5	10.6	10.2	9.7	9.4	8.8	8.2	8.5	9.4	10.1	10.4	10.9	10.7	10.9	10.6	10.2	9.6	9.4	9.4	9.9	10.2	11.0	11.0	11.0	10.0
Walla Walla, Wash	6.9	7.3	7.1	6.3	6.4	5.9	6.1	6.2	6.1	5.7	6.1	5.6	6.1	6.7	7.1	6.6	6.9	6.3	6.1	5.9	6.5	7.0	7.8	7.3	6.5
Washington, D. C	4.9	5.0	4.7	4.2	4.5	5.2	4.6	4.7	5.6	6.7	7.4	8.1	8.5	8.5	9.1	8.4	7.2	6.1	6.5	6.1	6.2	6.1	5.8	5.4	6.2
Wichita, Kans	9.0	8.6	8.9	9.1	9.1	9.3	9.7	9.7	9.5	9.9	10.3	11.0	12.2	12.5	12.4	11.9	11.8	9.7	8.2	7.8	8.4	8.5	8.7	9.0	9.8
Williston, N. Dak	7.0	7.1	7.0	6.9	6.2	6.2	5.7	5.9	5.8	6.0	6.0	6.1	6.6	8.6	9.3	9.1	8.8	7.6	6.5	6.1	6.1	5.6	7.0	7.4	6.9
Wilmington, N. C	6.8	6.9	7.0	7.0	7.3	7.5	7.4	7.0	8.3	9.1	9.3	9.3	9.6	9.6	9.5	8.8	8.0	6.5	6.7	6.0	6.1	6.4	6.5	6.6	7.6
Winnemucca, Nev	10.5	10.3	10.4	11.0	11.8	11.9	11.3	11.0	11.7	12.4	11.6	10.9	11.2	11.8	11.4	11.4	11.3	10.5	9.9	9.6	9.8	10.4	10.7	10.8	11.0
Woods Holl, Mass	16.2	16.8	16.0	14.5	14.1	14.4	14.4	14.2	14.4	14.9	14.4	14.5	15.7	15.5	14.9	14.9	14.7	14.7	15.7	14.9	15.5	16.1	15.6	16.0	15.1
Yuma, Ariz	4.3	3.9	4.4	4.5	4.1	4.4	4.8	4.5	4.8	4.6	4.9	5.0	6.2	6.4	6.8	7.0	7.8	7.8	7.1	6.0	4.9	4.5	4.1	4.4	5.3

TABLE VIII.—*Prevailing and resultant winds from self-registers for December, 1894.*

Number.	Station.	Prevailing wind.		Total movement.		Resultant direction.			Resultant movement.		Azimuth of movement minus direction.	Ratio of resultant movement to total movement.
		Direction from.	Duration.	Monthly.	Hourly average.	Direction from.	Duration.	Average hourly velocity.	Direction from.	Amount.		
	(1)	(2)	(3) Hours.	(4) Miles.	(5) Miles.	(6)	(7) Hours.	(8) Miles.	(9)	(10) Miles.	(11) °	(12)
1	Eastport, Me	nw.	199	9,253	12.4	n. 78 w.	311	11.7	n. 69 w.	3,652	+ 9	0.395
2	Portland, Me	nw.	173	5,701	7.7	n. 64 w.	351	7.4	n. 55 w.	2,595	+ 9	0.455
4	Boston, Mass	w.	215	8,465	11.4	n. 72 w.	377	11.4	n. 70 w.	4,310	+ 2	0.509
5	Nantucket, Mass	n.	175	9,000	12.1	n. 22 w.	214	11.8	n. 3 w.	2,521	+ 19	0.280
8	New Haven, Conn	n.	199	7,102	9.5	n. 30 w.	308	11.0	n. 21 w.	3,385	+ 9	0.477
10	Albany, N. Y	s.	274	5,496	7.4	s. 42 w.	108	10.7	s. 55 w.	1,158	+ 13	0.211
11	New York, N. Y	nw.	202	8,061	10.8	n. 52 w.	287	12.7	n. 38 w.	3,633	+ 14	0.451
13	Philadelphia, Pa	nw.	212	7,490	10.1	n. 46 w.	248	12.2	n. 37 w.	3,022	+ 9	0.404
15	Baltimore, Md	nw.	156	5,054	6.8	n. 59 w.	159	11.8	n. 53 w.	1,881	+ 6	0.372
16	Washington, D. C	nw.	178	4,632	6.2	n. 56 w.	209	9.9	n. 49 w.	2,064	+ 7	0.446
17	Lynchburg, Va	sw.	202	3,221	4.3	n. 80 w.	193	6.9	n. 63 w.	1,335	+ 17	0.414
18	Norfolk, Va	w.	254	6,307	8.5	n. 53 w.	183	8.9	n. 65 w.	1,622	− 12	0.257
24	Wilmington, N. C	nw.	228	5,676	7.6	n. 40 w.	256	7.9	n. 40 w.	2,012	0	0.354
26	Augusta, Ga	nw.	226	3,296	4.4	n. 37 w.	167	7.0	n. 53 w.	1,168	− 16	0.354
27	Savannah, Ga	nw.	183	5,772	7.8	n. 49 w.	103	14.4	n. 57 w.	1,481	− 8	0.257
28	Jacksonville, Fla	ne.	189	4,922	6.6	n. 4 w.	225	5.5	n. 18 w.	1,235	− 14	0.251
30	Key West, Fla	ne.	336	9,500	12.8	n. 41 e.	537	14.1	n. 32 e.	7,556	− 9	0.795
33	Atlanta, Ga	nw.	218	7,548	10.1	w.	85	23.3	n. 81 w.	1,982	+ 9	0.263
38	Vicksburg, Miss	n.	143	5,096	6.8	n. 46 e.	57	3.0	s. 36 w.	170	+170	0.033
39	New Orleans, La	n.	192	6,547	8.8	n. 45 e.	190	10.4	n. 17 e.	1,974	− 28	0.302
42	Little Rock, Ark	nw.	128	5,130	6.9	n. 66 w.	73	15.8	n. 40 w.	1,151	+ 26	0.224
44	Galveston, Tex	ne.	169	8,368	11.2	n. 83 e.	206	10.8	n. 47 e.	2,229	− 36	0.268
48	Knoxville, Tenn	sw.	214	3,676	4.9	s. 54 w.	100	10.6	s. 69 w.	1,063	+ 15	0.289
49	Memphis, Tenn	nw.	148	5,488	7.4	n. 62 w.	94	11.2	n. 66 w.	1,048	− 4	0.190
50	Nashville, Tenn	nw.	206	4,808	6.5	n. 80 w.	166	8.1	n. 80 w.	1,338	− 20	0.278
52	Louisville, Ky	s.	212	6,250	8.4	s. 18 w.	217	8.6	s. 41 w.	1,868	+ 23	0.299
53	Indianapolis, Ind	s.	166	5,621	7.6	s. 46 w.	224	7.7	s. 57 w.	1,733	+ 11	0.308
54	Cincinnati, Ohio	se.	184	6,070	8.2	s. 14 w.	149	9.9	s. 69 w.	1,474	+ 55	0.243
55	Columbus, Ohio	s.	164	5,378	7.2	s. 17 w.	217	6.5	s. 19 w.	1,407	+ 2	0.262
56	Pittsburg, Pa	w.	195	5,113	6.9	s. 72 w.	309	7.1	s. 70 w.	2,182	− 2	0.427
58	Buffalo, N. Y	nw.	204	11,375	15.3	s. 81 w.	292	22.3	s. 87 w.	6,520	+ 6	0.573
60	Rochester, N. Y	sw.	271	7,312	9.8	s. 61 w.	287	12.4	s. 68 w.	3,559	+ 7	0.487
62	Cleveland, Ohio	se.	227	11,554	15.5	s. 19 w.	277	16.6	s. 22 w.	4,610	+ 3	0.399
64	Toledo, Ohio	sw.	262	8,659	11.6	s. 75 w.	354	12.0	s. 72 w.	4,258	− 3	0.492
65	Detroit, Mich	sw.	330	9,471	12.7	s. 73 w.	377	14.5	s. 67 w.	5,455	− 6	0.576
66	Alpena, Mich	sw.	225	7,834	10.5	s. 58 w.	336	9.1	s. 65 w.	3,058	+ 7	0.390
67	Grand Haven, Mich	sw.	201	9,808	13.2	s. 62 w.	216	17.7	s. 69 w.	3,824	+ 7	0.390
68	Marquette, Mich	nw.	202	8,084	10.9	s. 85 w.	346	10.1	s. 83 w.	3,507	− 2	0.434
70	Sault Ste. Marie, Mich	se.	273	6,778	9.1	s. 27 e.	209	7.1	s. 1 e.	1,493	+ 26	0.220
71	Chicago, Ill	sw.	233	14,151	19.0	s. 77 w.	288	21.2	s. 67 w.	6,110	− 10	0.432
72	Milwaukee, Wis	w.	202	8,791	11.8	s. 82 w.	402	11.4	s. 80 w.	4,583	− 2	0.533
74	Duluth, Minn	w.	200	4,824	6.5	n. 74 w.	306	7.4	n. 67 w.	2,257	+ 7	0.468
75	Moorhead, Minn	s.	208	7,914	10.6	s. 78 w.	131	11.4	s. 79 w.	1,495	+ 1	0.189
77	Bismarck, N. Dak	nw.	282	5,848	7.9	n. 44 w.	250	13.7	n. 39 w.	3,435	+ 5	0.587
79	Saint Paul, Minn	se.	210	6,079	8.2	s. 43 w.	253	8.7	s. 69 w.	2,205	+ 26	0.363
81	Davenport, Iowa	sw.	248	7,514	10.1	s. 67 w.	333	11.1	s. 64 w.	3,702	− 3	0.493
82	Des Moines, Iowa	sw.	180	6,383	8.6	n. 79 w.	271	9.4	n. 88 w.	2,539	− 9	0.397
88	Saint Louis, Mo	nw.	137	9,189	12.4	s. 74 w.	208	14.7	s. 67 w.	3,050	− 7	0.332
90	Kansas City, Mo	nw.	182	7,533	10.1	s. 59 w.	146	10.3	s. 48 w.	1,503	− 11	0.120
92	Omaha, Nebr	nw.	207	5,734	7.7	s. 85 w.	233	7.1	s. 87 w.	1,663	+ 2	0.290
96	Huron, S. Dak	nw.	208	9,687	13.0	s. 70 w.	201	12.9	s. 77 w.	2,592	+ 7	0.268
98	Havre, Mont	w.	208	6,476	8.7	n. 73 w.	303	13.1	s. 78 w.	3,967	− 29	0.612
100	Helena, Mont	sw.	323	3,915	5.3	s. 83 w.	460	6.3	s. 68 w.	2,881	− 15	0.736
107	Denver, Colo	s.	212	5,142	6.9	s. 30 w.	225	6.5	s. 40 w.	1,463	+ 10	0.284
111	Dodge City, Kans	nw.	174	8,054	10.8	n. 34 w.	175	4.1	n. 14 w.	710	+ 20	0.088
114	Abilene, Tex	s.	175	7,336	9.9	s. 52 w.	163	12.7	s. 66 w.	2,068	+ 14	0.282
116	El Paso, Tex	nw.	188	8,398	11.3	n. 6 w.	209	13.4	n. 10 w.	2,798	− 4	0.333
117	Santa Fe, N. Mex	ne.	178	4,264	5.7	n. 67 e.	51	10.0	n. 2 w.	510	− 69	0.120
119	Yuma, Ariz	n.	204	3,943	5.3	n. 1 e.	320	5.9	n. 16 w.	1,886	− 17	0.478
122	Salt Lake City, Utah	se.	290	4,132	5.6	s. 15 e.	279	6.1	s. 12 e.	1,690	+ 3	0.409
125	Spokane, Wash	ne.	153	4,250	5.7	n. 83 e.	239	7.0	s. 56 e.	1,474	+ 41	0.347
130	Seattle, Wash	s.	222	4,468	6.0	s. 50 e.	218	9.5	s. 28 e.	2,064	+ 22	0.462
132	Portland, Oregon	se.	189	8,030	10.8	s. 34 e.	252	13.7	s. 30 e.	3,450	+ 4	0.430
133	Roseburg, Oregon	sw.	95	2,059	2.8	s. 8 w.	118	7.3	s. 4 e.	861	− 12	0.418
137	San Francisco, Cal	se.	224	6,704	9.0	s. 56 e.	166	14.3	s. 39 e.	2,375	+ 17	0.354
140	San Diego, Cal	ne.	162	3,197	4.3	n. 26 e.	161	2.5	n. 13 e.	405	− 13	0.127

TABLE IX.—*Resultant winds from observations at 8 a. m. and 8 p. m., daily, during December, 1894.*

Number.	Station.	Component direction from—				Resultant.	
		N.	S.	E.	W.	Direction from—	Duration.
	New England.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
1	Eastport, Me	23	16	6	32	n. 75 w.	27
2	Portland, Me	26	13	4	35	n. 67 w.	34
3	Northfield, Vt	20	30	5	19	s. 54 w.	17
4	Boston, Mass	18	13	6	36	n. 81 w.	30
5	Nantucket, Mass	31	12	15	19	n. 12 w.	19
6	Woods Holl, Mass	14	6	4	14	n. 51 w.	13
7	Block Island, R. I	26	8	15	29	n. 38 w.	23
8	New Haven, Conn	36	7	3	25	n. 37 w.	36
9	New London, Conn	25	9	8	35	n. 59 w.	31
	Middle Atlantic States.						
10	Albany, N. Y	21	27	9	13	s. 34 w.	7
11	New York, N. Y	29	11	11	28	n. 43 w.	25
12	Harrisburg, Pa	21	9	20	23	n. 14 w.	12
13	Philadelphia, Pa	28	12	11	28	n. 47 w.	23
14	Atlantic City, N. J	27	10	8	28	n. 50 w.	26
15	Baltimore, Md	22	15	14	23	n. 52 w.	11
16	Washington, D. C	28	15	11	20	n. 35 w.	16
17	Lynchburg, Va	23	17	10	29	n. 72 w.	20
18	Norfolk, Va	16	7	17	25	n. 42 w.	12
	South Atlantic States.						
19	Charlotte, N. C	16	21	18	23	s. 45 w.	7
20	Hatteras, N. C	34	11	6	19	n. 29 w.	26
21	Kittyhawk, N. C	27	9	20	24	n. 13 w.	18
22	Raleigh, N. C	27	16	10	23	n. 50 w.	17
24	Wilmington, N. C	26	15	16	23	n. 32 w.	13
25	Charleston, S. C	24	15	22	18	n. 24 e.	10
26	Augusta, Ga	29	11	16	24	n. 24 w.	20
27	Savannah, Ga	24	20	13	20	n. 60 w.	8
28	Jacksonville, Fla	33	12	16	17	n. 3 w.	21
	Florida Peninsula.						
29	Jupiter, Fla	31	8	21	20	n. 2 e.	23
30	Key West, Fla	40	5	31	1	n. 41 e.	46
31	Tampa, Fla	40	8	18	10	n. 14 e.	33
32	Titusville, Fla	31	9	11	23	n. 29 w.	25
	Eastern Gulf States.						
33	Atlanta, Ga	19	17	19	24	n. 68 w.	5
34	Pensacola, Fla	29	19	17	14	n. 17 e.	10
35	Mobile, Ala	32	19	7	13	n. 25 w.	14
36	Montgomery, Ala	36	14	17	19	n. 9 w.	12
37	Meridian, Miss	27	20	15	12	n. 23 e.	8
38	Vicksburg, Miss	23	19	18	14	n. 45 e.	6
39	New Orleans, La	30	16	21	7	n. 45 e.	20
	Western Gulf States.						
40	Shreveport, La	21	23	18	13	s. 68 e.	5
41	Fort Smith, Ark	18	11	29	14	n. 65 e.	17
42	Little Rock, Ark	23	20	12	20	n. 69 w.	8
43	Corpus Christi, Tex	28	12	28	8	n. 51 e.	26
44	Galveston, Tex	24	19	26	8	n. 74 e.	19
45	Palestine, Tex	18	24	8	22	s. 67 w.	15
46	San Antonio, Tex	22	16	30	9	n. 74 e.	22
	Ohio Valley and Tennessee.						
47	Chattanooga, Tenn	19	22	14	17	s. 45 w.	4
48	Knoxville, Tenn	24	14	21	19	n. 11 e.	10
49	Memphis, Tenn	25	20	13	16	n. 31 w.	6
50	Nashville, Tenn	23	18	10	25	n. 72 w.	16
51	Lexington, Ky	11	24	11	26	e. 49 w.	20
52	Louisville, Ky	11	27	16	19	s. 11 w.	16
53	Indianapolis, Ind	16	28	9	24	s. 51 w.	19
54	Cincinnati, Ohio	19	23	14	23	s. 66 w.	10
55	Columbus, Ohio	13	30	13	19	s. 19 w.	18
56	Pittsburg, Pa	10	26	11	27	s. 45 w.	23
57	Parkersburg, W. Va	6	28	21	18	s. 8 e.	22
	Lower Lake Region.						
58	Buffalo, N. Y	16	20	10	32	s. 80 w	28
59	Oswego, N. Y	12	35	13	16	s. 7 w.	28
60	Rochester, N. Y	13	26	8	30	s. 60 w.	26
61	Erie, Pa	8	32	9	26	s. 35 w.	29
62	Cleveland, Ohio	11	27	19	25	s. 21 w.	22
63	Sandusky, Ohio	10	25	10	30	s. 53 w.	15
64	Toledo, Ohio	16	22	6	34	s. 78 w.	29
65	Detroit, Mich	12	23	8	35	s. 68 w.	29
	Upper Lake Region.						
66	Alpena, Mich	12	24	10	31	s. 60 w.	24
67	Grand Haven, Mich	16	22	14	28	s. 67 w.	15
68	Marquette, Mich	17	20	3	33	s. 84 w.	30
69	Port Huron, Mich	9	26	6	36	s. 60 w.	34
70	Sault Ste. Marie, Mich	12	24	26	18	s. 34 e.	14

Number.	Station.	Component direction from—				Resultant.	
		N.	S.	E.	W.	Direction from—	Duration.
	Upper Lake Region—Cont'd.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
71	Chicago, Ill	16	21	8	34	s. 79 w.	26
72	Milwaukee, Wis	15	18	4	37	s. 85 w.	33
73	Green Bay, Wis	12	32	2	28	s. 52 w.	33
74	Duluth, Minn	17	11	11	37	n. 77 w.	27
	North Dakota.						
75	Moorhead, Minn	22	23	10	20	s. 84 w.	10
76	Saint Vincent, Minn	22	23	12	17	s. 79 w.	5
77	Bismarck, N. Dak	29	11	12	26	n. 38 w.	23
78	Williston, N. Dak	15	29	9	21	s. 41 w.	18
	Upper Mississippi Valley.						
79	Saint Paul, Minn	14	25	16	29	s. 47 w.	18
80	La Crosse, Wis	16	35	3	15	s. 32 w.	22
81	Davenport, Iowa	12	22	10	31	s. 65 w.	23
82	Des Moines, Iowa	25	17	8	30	n. 70 w.	23
84	Keokuk, Iowa	19	21	6	29	s. 85 w.	23
85	Cairo, Ill	22	26	6	16	s. 68 w.	11
86	Springfield, Ill	23	22	7	23	n. 87 w.	16
87	Hannibal, Mo	17	20	7	28	s. 82 w.	21
88	Saint Louis, Mo	17	24	8	24	s. 66 w.	18
	Missouri Valley.						
89	Columbia, Mo	9	10	4	15	s. 85 w.	11
90	Kansas City, Mo	22	27	13	17	s. 39 w.	6
91	Springfield, Mo	22	25	11	17	s. 63 w.	7
92	Omaha, Nebr	20	21	6	29	s. 88 w.	23
93	Valentine, Nebr	16	16	4	42	w.	38
94	Sioux City Iowa	24	24	9	19	w.	10
95	Pierre, S. Dak	20	18	10	26	n. 83 w.	16
96	Huron, S. Dak	18	21	11	28	s. 80 w.	17
	Northern Slope.						
98	Havre, Mont	17	11	11	35	n. 76 w.	25
99	Miles City, Mont	12	34	14	20	s. 15 w.	23
100	Helena, Mont	15	20	2	43	s. 83 w.	41
101	Rapid City, S. Dak	10	15	5	41	s. 82 w.	36
102	Cheyenne, Wyo	29	10	1	37	n. 62 w.	41
103	Lander, Wyo	12	29	12	22	s. 30 w.	20
105	North Platte, Nebr	17	17	7	36	w.	29
	Middle Slope.						
107	Denver, Colo	15	32	9	18	s. 28 w.	19
109	Pueblo, Colo	33	10	9	27	n. 38 w.	29
110	Concordia, Kans	17	23	8	23	s. 68 w.	16
111	Dodge City, Kans	28	13	13	23	n. 34 w.	18
112	Wichita, Kans	28	25	9	13	n. 53 w.	5
113	Oklahoma, Okla	23	29	7	14	s. 49 w.	9
	Southern Slope.						
114	Abilene, Tex	20	27	10	16	s. 41 w.	9
115	Amarillo, Tex	22	29	6	15	s. 52 w.	11
	Southern Plateau.						
116	El Paso, Tex	22	6	25	25	n.	16
117	Santa Fe, N. Mex	25	18	26	13	n. 62 e.	15
118	Tucson, Ariz	15	22	18	18	s.	7
119	Yuma, Ariz	34	5	16	15	n. 2 e.	29
	Middle Plateau.						
....	Carson City, Nev	14	32	12	23	s. 31 w.	21
121	Winnemucca, Nev	18	12	31	10	n. 74 e.	22
122	Salt Lake City, Utah	9	30	24	16	s. 21 e.	22
	Northern Plateau.						
123	Baker City, Oreg	6	38	29	9	s. 32 e.	38
124	Idaho Falls, Idaho	26	20	4	28	n. 76 w.	25
125	Spokane, Wash	20	18	30	5	n. 85 e.	25
126	Walla Walla, Wash	4	39	13	13	s.	35
	North Pacific Coast Region.						
127	Fort Canby, Wash	11	14	38	10	s. 84 e.	28
129	Port Angeles, Wash	3	42	16	13	s. 4 e.	39
130	Seattle, Wash	22	26	21	6	s. 75 e.	16
131	Tatoosh Island, Wash	4	16	44	10	s. 71 e.	36
132	Portland, Oreg	12	31	20	12	s. 23 e.	21
133	Roseburg, Oreg	10	22	19	21	s. 9 w.	12
	Middle Pacific Coast Region.						
134	Eureka, Cal	13	23	33	12	s. 65 e.	23
135	Red Bluff, Cal	27	20	12	17	n. 36 w.	9
136	Sacramento, Cal	27	25	20	5	n. 82 e.	15
137	San Francisco, Cal	18	20	23	17	s. 72 e.	6
	South Pacific Coast Region.						
138	Fresno, Cal	13	17	30	17	s. 73 e.	14
139	Los Angeles, Cal	21	2	27	20	n. 20 e.	20
140	San Diego, Cal	24	12	22	19	n. 14 e.	12
141	San Luis Obispo, Cal	20	22	17	16	s. 27 e.	2

TABLE X*a*.—*Temperature data for selected voluntary stations, Dec.*, 1894.

State and station.	Normal for month.	Length of record.	Mean, Dec., 1894.	Departure from the normal.	Extreme monthly means.			
					Highest.	Year.	Lowest.	Year.
Arizona.	°	Years	°	°	°		°	
Fort Apache	37.7	23	41.6	+ 3.9	45.0	1889	27.6	1891
Whipple Barracks	37.7	22	39.1	+ 1.4	42.2	1889	31.4	1891
Arkansas.								
Keesees Ferry	39.8	13	41.4	+ 1.6	55.3	1889	29.1	1884
California.								
Riverside	52.8	12	53.2	+ 0.4	56.5	1882	48.3	1891
Colorado.								
Las Animas	30.9	11	30.2	— 0.7	41.9	1889	19.5	1884
Florida.								
Merritts Island	63.5	12	64.0	+ 0.5	68.0	1891	58.0	1885
Georgia.								
Forsyth	50.2	20	51.8	+ 1.6	61.3	1889	39.8	1876
Idaho.								
Boise Barracks	33.2	19	31.2	— 2.0	37.7	1886	28.1	1884
Fort Sherman	30.9	11	29.7	— 1.2	37.9	1890	16.0	1884
Indiana.								
Lafayette	30.0	13	33.4	+ 3.4	43.8	1889	21.3	1880
Iowa.								
Cresco	17.7	23	26.4	+ 8.7	34.0	1877	4.5	1876
Kansas.								
Eureka Ranch	32.9	11	29.6	— 3.3	43.6	1889	21.3	1884
Independence	35.3	22	37.2	+ 1.9	49.3	1889	25.4	1884
Salina	32.8	11	.....	.....	44.4	1889	23.2	1885
Louisiana.								
Grand Coteau	56.0	12	56.1	+ 0.1	65.0	1889	51.8	1887
Maine.								
Orono	21.0	24	21.4	+ 0.4	31.6	1891	11.4	1890
Maryland.								
Cumberland	32.2	23	33.0	+ 0.8	43.2	1889	26.0	1880
Michigan.								
Kalamazoo	29.4	18	32.6	+ 3.2	40.2	1889	16.7	1876
Missouri.								
Sedalia	36.2	9	.....	.....	49.4	1889	25.7	1886
Montana.								
Fort Custer	23.9	14	.....	.....	33.1	1885	5.6	1884
Nebraska.								
Fort Robinson	28.8	10	29.8	+ 1.0	38.0	1889	12.4	1884
Genoa (near)	23.8	19	30.7	+ 6.9	35.4	1889	11.8	1879
Nevada.								
Carson City	34.2	17	29.3	— 4.9	40.8	1886	29.1	1891
New Hampshire.								
Hanover	20.7	23	23.1	+ 2.4	30.5	1881	10.2	1872
New Mexico.								
Fort Wingate	33.0	23	35.2	+ 2.2	41.0	1889	23.7	1887
New York.								
Cooperstown	26.9	23	27.3	+ 0.4	33.9	1891	14.7	1876
Plattsburg Barracks	21.6	23	24.2	+ 2.6	33.8	1891	11.3	1890
North Carolina.								
Lenoir	38.5	22	38.7	+ 0.2	48.9	1889	29.1	1876
Oklahoma.								
Fort Reno	40.0	11	39.7	— 0.3	52.6	1889	27.9	1884
Fort Sill	40.5	22	42.8	+ 2.3	52.3	1889	31.0	1884
Fort Supply	37.6	14	.....	.....	49.2	1889	29.9	1887, 1892
Oregon.								
Bandon	46.8	10	44.8	— 2.0	52.5	1888	43.6	1884
Pennsylvania.								
Dyberry	25.6	23	26.8	+ 1.2	34.6	1891	17.3	1876
Grampian	26.0	23	28.8	+ 2.8	37.0	1877	16.0	1876
Wellsboro	29.4	15	28.2	— 1.2	39.5	1881	22.2	1890
South Carolina.								
Statesburg	48.0	13	48.7	+ 0.7	56.6	1889	43.6	1882
South Dakota.								
Fort Sully	19.2	23	.....	.....	30.0	1881	2.9	1879
Texas.								
Austin	50.5	22	50.8	+ 0.3	65.5	1889	42.1	1872
Silver Falls	45.2	8	44.7	— 0.5	56.1	1889	37.6	1892
Utah.								
Terrace	28.1	22	24.8	— 3.3	37.0	1888	17.0	1878
Vermont.								
Strafford	21.9	21	22.4	+ 0.5	31.2	1891	13.4	1890
Virginia.								
Dale Enterprise	38.2	14	35.0	— 3.2	49.0	1889	28.4	1882
Washington.								
Fort Townsend	41.1	19	35.4	— 5.7	45.6	1893	33.0	1884
Wisconsin.								
Madison	22.9	22	29.0	+ 6.1	38.4	1877	10.8	1876
Wyoming.								
Fort Washakie	23.3	11	20.4	— 2.9	29.6	1889	16.4	1892

TABLE X*b*.—*Precipitation data for selected voluntary stations, Dec.*, 1894.

State and station.	Normal for month.	Length of record.	Total, Dec., 1894.	Departure from the normal.	Extremes.			
					Greatest.		Least.	
					Am't.	Year.	Am't.	Year.
Arizona.	*Inches.*	*Years*	*Inches.*	*Inches.*	*Inches.*		*Inches*	
Fort Apache	1.56	18	2.81	+ 1.25	5.52	1884	0.08	1882
Whipple Barracks	1.74	22	3.43	+ 1.69	7.38	1889	0.00	*
Arkansas.								
Keesees Ferry	3.20	13	2.40	— 0.80	11.37	1884	1.15	1889
California.								
Riverside	2.00	14	5.18	+ 3.18	6.87	1889	0.17	1886
Colorado.								
Las Animas	0.43	12	1.15	+ 0.72	1.68	1883	0.00	1889
Florida.								
Merritts Island	2.46	16	1.30	— 1.16	8.55	1888	0.00	1889
Georgia.								
Forsyth	4.26	20	4.75	+ 0.49	7.56	1887	0.79	1889
Idaho.								
Boise Barracks	2.10	21	1.98	— 0.12	5.96	1871	0.01	1877
Fort Sherman	3.45	11	1.30	— 2.15	5.85	1889	1.30	1894
Indiana.								
Lafayette	2.56	14	2.33	— 0.23	6.27	1884	0.23	1890
Iowa.								
Cresco	1.40	23	1.07	— 0.33	3.44	1891	0.30	1874
Kansas.								
Eureka Ranch	0.69	11	1.33	+ 0.64	1.61	1884	0.00	1889
Independence	2.13	22	1.82	— 0.31	5.17	1879	0.49	1893
Salina	0.84	11	.....	.....	2.52	1892	T.	1889, 1890
Louisiana.								
Grand Coteau	5.20	11	1.44	— 3.76	14.43	1884	1.44	1894
Maine.								
Orono	3.92	24	1.75	— 2.17	7.92	1878	1.50	1875
Maryland.								
Cumberland	2.17	23	2.63	+ 0.46	4.50	1881	0.70	1871
Michigan.								
Kalamazoo	2.76	18	1.08	— 1.68	7.14	1884	1.08	1894
Missouri.								
Sedalia	1.94	16	.....	.....	4.77	1884	0.53	1886
Montana.								
Fort Custer	0.79	14	0.40	— 0.39	1.87	1883	0.09	1885
Nebraska.								
Fort Robinson	0.72	11	0.44	— 0.28	1.97	1883	0.01	1890
Genoa (near)	0.89	19	0.97	+ 0.08	2.04	1893	0.00	1875, 1890
Nevada.								
Carson City	2.09	17	3.23	+ 1.14	5.43	1891	0.60	1876
New Hampshire.								
Hanover	2.55	23	2.45	— 0.10	4.69	1878	0.78	1875
New Mexico.								
Fort Wingate	0.90	23	2.32	+ 1.42	2.32	1894	0.10	1886
New York.								
Cooperstown	2.70	23	2.33	— 0.37	6.02	1881	0.97	1877
Plattsburg Barracks	1.96	23	2.55	+ 0.59	3.92	1893	0.17	1886
North Carolina.								
Lenoir	3.48	20	6.21	+ 2.73	8.70	1877	0.50	1889
Oklahoma.								
Fort Reno	1.42	11	0.10	— 1.32	4.40	1892	0.00	1886
Fort Sill	1.72	22	0.65	— 1.07	4.07	1874	0.00	1889
Fort Supply	0.73	14	.....	.....	3.19	1885	0.00	1886, 1889
Oregon.								
Bandon	11.52	16	16.13	+ 4.61	17.17	1892	4.93	1878
Pennsylvania.								
Dyberry	2.77	23	3.89	+ 1.12	5.29	1890	1.20	1874
Grampian	3.62	17	3.85	+ 0.23	5.15	1891	1.36	1892
Wellsboro	4.34	15	4.07	— 0.27	9.57	1881	0.40	1892
South Carolina.								
Statesburg	2.90	13	2.90	0.00	5.87	1884	0.75	1889
South Dakota.								
Fort Sully	0.48	23	.....	.....	2.48	1877	0.00	1881
Texas.								
Austin	2.98	21	0.00	— 2.98	9.00	1891	0.00	1894
Silver Falls	0.71	7	T.	— 0.71	2.03	1891	0.00	1889
Utah.								
Terrace	0.74	21	0.96	+ 0.22	2.12	1877	0.00	1874, 1878
Vermont.								
Strafford	3.28	21	3.00	— 0.28	5.90	1878	0.15	1875
Virginia.								
Dale Enterprise	2.63	14	2.45	— 0.18	6.81	1881	0.13	1882
Washington.								
Fort Townsend	2.82	20	3.55	+ 0.73	5.34	1891	1.14	1879
Wisconsin.								
Madison	1.98	22	0.67	— 1.31	5.73	1884	0.45	1874
Wyoming.								
Fort Washakie	0.48	11	0.00	— 0.48	2.29	1886	0.00	1890, 1894

*Frequently.

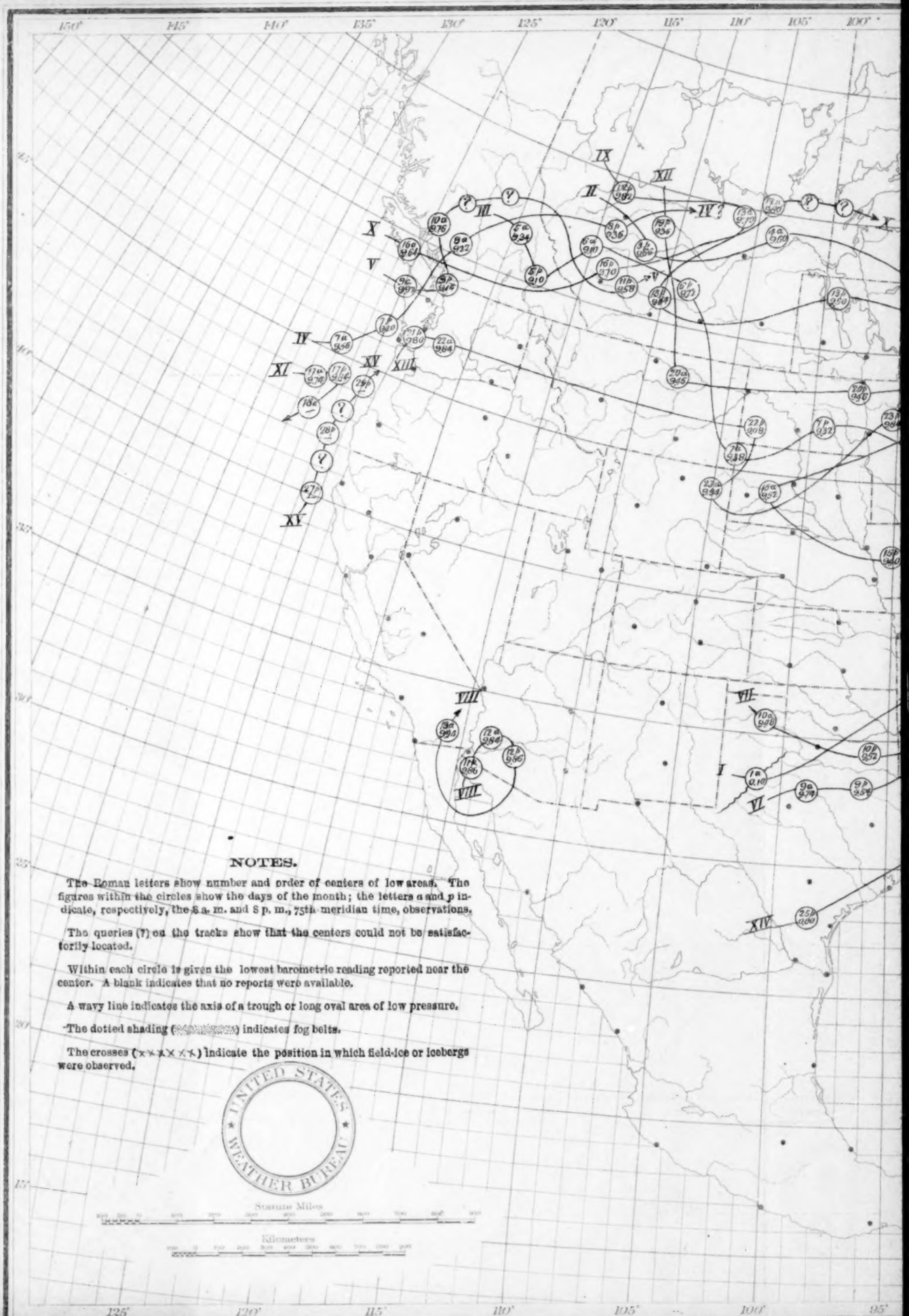
TABLE XI.—*Thunderstorms and auroras, December, 1894.*

States.	No. of stations.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.	
Alabama	50	T.								1		6	8	3																				18	T.
		A.																																0	A.
Arizona	49	T.																												1				1	T.
		A.																																0	A.
Arkansas	39	T.	1	2							4															1								8	T.
		A.																																0	A.
Colorado	85	T.																																0	T.
		A.																																0	A.
California	339	T.						4	1		2		1									1	3	1				1						13	T.
		A.																																0	A.
Connecticut	22	T.																																0	T.
		A.																																0	A.
Delaware	7	T.												2																				2	T.
		A.																																0	A.
District of Columbia	4	T.																																0	T.
		A.																																1	A.
Florida	35	T.						1				1	15	11															1					28	T.
		A.																																0	A.
Georgia	30	T.										6	8	7																				21	T.
		A.																																0	A.
Idaho	26	T.																																0	T.
		A.																																0	A.
Illinois	60	T.	4						1	4	1																							10	T.
		A.																																0	A.
Indiana	40	T.								10			1	2																				13	T.
		A.				1		1			1	2																						5	A.
Indian Territory	6	T.																																0	T.
		A.																																0	A.
Iowa	84	T.																																0	T.
		A.			1																													1	A.
Kansas	73	T.	2								1					1	1																	5	T.
		A.																																0	A.
Kentucky	42	T.								2		1	3																					6	T.
		A.																																0	A.
Louisiana	47	T.		2	3	1				3	9	5	6														1							30	T.
		A.																																0	A.
Maine	15	T.																																0	T.
		A.					1																											1	A.
Maryland	35	T.												3																				3	T.
		A.																																0	A.
Massachusetts	83	T.																																0	T.
		A.																													1			1	A.
Michigan	80	T.						1		9																								10	T.
		A.																																0	A.
Minnesota	65	T.																				1												1	T.
		A.																		1			1				1							3	A.
Mississippi	47	T.		1							3	4	4														1							13	T.
		A.																																0	A.
Missouri	98	T.	12	2				1	1	7	3															8	1							35	T.
		A.																																0	A.
Montana	30	T.																																0	T.
		A.					1													1														2	A.
Nebraska	120	T.																																0	T.
		A.																																0	A.
Nevada	46	T.																																0	T.
		A.																																0	A.
New Hampshire	25	T.						2	1																		1							4	T.
		A.																																0	A.
New Jersey	60	T.												5																				5	T.
		A.															1																	1	A.
New Mexico	27	T.																																0	T.
		A.																																0	A.
New York	86	T.												2																				2	T.
		A.																								1								1	A.
North Carolina	54	T.										8	12	15				1	1								1	6						43	T.
		A.															1																	1	A.
North Dakota	38	T.																			6													6	T.
		A.							1								1				1		1	1									1	6	A.
Ohio	147	T.							1	32				1																				34	T.
		A.																					1											1	A.
Oklahoma	16	T.	1								1																							2	T.
		A.																																0	A.
Oregon	63	T.									2											1												3	T.
		A.																																0	A.
Pennsylvania	84	T.								1				5			1																	7	T.
		A.																																0	A.
Rhode Island	8	T.																																0	T.
		A.																																0	A.
South Carolina	37	T.										5	3	6														2						16	T.
		A.																																0	A.
South Dakota	44	T.																																0	T.
		A.								1						1																		2	A.
Tennessee	39	T.									1	4	1																					6	T.
		A.																																0	A.
Texas	82	T.			1						5	1																						7	T.
		A.																																0	A.
Utah	39	T.																				1												1	T.
		A.																																0	A.
Vermont	15	T.																																0	T.
		A.																																0	A.
Virginia	40	T.										3	3														1	1	1					9	T.
		A.																																0	A.
Washington	51	T.															1																	1	T.
		A.																																1	A.
West Virginia	40	T.							4																					1				4	T.
		A.																																0	A.
Wisconsin	66	T.																																0	T.
		A.							1										1	1	1					1		1			1			7	A.
Wyoming	11	T.																																0	T.
		A.																																0	A.
Sums	2,740	T.	20	7	4	1	0	9	5	73	31	38	67	66	0	1	1	2	1	0	0	9	4	1	0	9	6	10	1	0	1	0	0	367	T.
		A.	0	0	1	1	1	2	1	2	1	2	1	0	0	0	3	1	0	3	2	1	3	1	0	2	0	1	1	2	1	1	1	35	A.

TABLE XII.—*Climatological data from the monthly reports of the State Weather Services, December, 1894.*

State.	Temperature.											Precipitation.					Director.
							Monthly ranges.						Maximum.		Minimum.		
	Mean departure.	Maximum.	Date.	Station.	Minimum.	Date.	Station.	Greatest.	Station.	Least.	Station.	Mean departure	Amount.	Station.	Amount.	Station.	
	°	°			°			°		°		*Inches*	*Inches*		*Inches*		
Alabama	+1.6	81	8	Daphne	0	28	Marion	76	Jasper †	57	Citronelle	+0.14	7.69	Oxanna	0.75	Brewton	F. P. Chaffee.
Alaska																	Not yet organized.
Arizona	+5.1	85	1	Buckeye	6	11	Flagstaff	59	Buckeye	32	Peoria	+0.89	5.99	Flagstaff	0.40	Yuma	W. Burrows.
Arkansas	−1.0	82	8	Bee Branch	−11	27	Pocahontas	81	Pocahontas	60	Little Rock	−0.96	7.15	Helena *b*	1.45	Rogers	F. H. Clarke.
California	−5.7	80	3	Florence	− 6	26	Greenville	49	Yreka	18	Point Lobos	+5.01	38.41	Fordyce Dam	1.05	Keeler	J. A. Barwick.
Colorado	−2.3	78	*	Las Animas †	−30	28	Crook	102	Las Animas	44	Climax	+0.38	11.81	Ruby	T.	Garnett †	F. H. Brandenburg.
Connecticut	+0.1	57	15	N. Grosvenor Dale.	− 6	30	N. Grosvenor Dale.	63	N. Grosvenor Dale.	47	Windsor	+0.46	5.25	New London	3.33	New Haven	J. Warren Smith.
Delaware		68	12	Seaford	6	29	Newark	59	Seaford	49	Milford		5.30	Wilmington	2.37	Millsboro	C. P. Cronk.
District of Columbia																	See Maryland.
Florida	+0.4	86	11	Kissimmee †	12	29	Tallahassee	70	Archer	37	Key West	−2.49	3.20	Moseley Hall	0.09	New Smyrna	E. R. Demain.
Georgia	+2.0	81	11	Darien †	0	28	Toccoa	72	Brag	56	Hawkinsville	−0.06	11.11	Toccoa	0.40	Darien	George E. Hunt.
Idaho		64	21	Idaho City	−22	27	Chesterfield	78	Paris	39	Fort Sherman		4.20	Kootenai	0.35	Bliss	D. P. McCallum.
Illinois	+5.0	71	21	Jordans Grove	− 7	28	Zion					−0.25	5.41	Golconda	0.33	Winnebago	Prof. W. L. Moore.
Indiana	+2.4	66	*	Huntingburg †	− 8	28	Marengo	74	Marengo	50	South Bend	+0.13	7.15	Marengo	1.09	South Bend	Prof. H. A. Huston.
Indian Territory																	See Oklahoma.
Iowa	+6.6	73	7	Knoxville	−17	27	Rock Rapids †	78	Knoxville	50	Hopkinton	−0.70	1.75	Decorah †	0.25	Maxon	J. R. Sage.
Kansas	+0.9	85	*	Gove †	−21	28	Hays City	100	Kiowa	70	Eldora †	+0.05	2.75	Blaine	0.15	Johnson	T. B. Jennings.
Kentucky	+1.0	76	8	Bowling Green	−11	29	Sandy Hook	77	Bowling Green	46	Princeton	+0.90	6.05	Alpha	2.44	Canton	Frank Burke.
Louisiana	−0.3	89	9	Maurepas	5	*	Sugartown	78	Liberty Hill	45	Port Eads	−0.72	6.42	Delhi	0.50	Port Eads	R. E. Kerkam.
Maine	+0.4	55	15	Portland	−18	31	Houlton	64	Houlton	52	Eastport	−1.62	3.83	Belfast †	1.75	Orono †	J. Warren Smith.
Maryland	+0.2	74	*	Denton †	−10	29	Deer Park †	75	Sunnyside	40	Marshall Hall	+0.34	5.26	Sunnyside	1.41	Woodstock	C. P. Cronk.
Massachusetts	+0.5	59	*	Taunton *d* †	−12	30	Monroe	63	Lake Cochituate	41	Provincetown	+0.77	6.87	Vineyard Haven	1.75	Williamstown	J. Warren Smith.
Michigan	+2.9	65	21	Vandalia	−19	28	Sault Ste. Marie	67	Cheboygan †	44	Benzonia	−1.18	3.07	Sault Ste. Marie	0.31	Fairview	C. F. Schneider.
Minnesota	+6.8	56	*	Dawson †	−30	27	Leech Lake	80	Dawson	60	Caledonia	−0.28	2.02	Two Harbors	T.	Campbell †	E. A. Beals.
Mississippi	+1.8	87	8	Vaiden	2	*	French Camps †	80	Vaiden	55	Mayersville	−0.94	6.76	Briers	0.70	Moss Point	R. J. Hyatt.
Missouri	+2.8	72	7	Lebanon	− 7	28	Unionville	80	Unionville	56	New Boston	−0.03	5.79	Gordonville	T.	New Boston	A. E. Hackett.
Montana	+6.0	60	18	Billings	−29	28	Deer Lodge City	79	Deer Lodge City	51	Virginia City	+0.14	1.57	Troy	0.07	Pony	R. M. Crawford.
Nebraska	+3.8	77	4	Weeping Water	−20	27	Agee †	87	Benkleman	01	York	−0.31	1.01	Salem	0.00	Callaway	Prof. G. D. Swezey.
Nevada	−4.6	64	5	Golconda	−32	26	Stofiel	81	Elko	37	Tybo	+0.53	8.77	Marlette Lake	0.44	Hawthorne *b*	Prof. C. W. Friend.
New Hampshire	+0.2	57	15	West Milan	−32	30	West Milan	89	West Milan	50	Newton	−0.08	3.67	West Milan	1.59	Wolfboro	J. Warren Smith.
New Jersey	+2.3	66	12	Whiting	− 3	28	River Vale	65	Somerville	44	Cape May	+0.74	6.39	Toms River	1.64	Cape May	E. W. McGann.
New Mexico		80	20	Eddy	− 8	28	Halls Peak	76	Fort Wingate	45	Galisteo †		3.20	Chama	T.	Albert †	H. B. Hersey.
New York	+1.0	67	17	Marlboro	−37	29	Canton	96	Canton	47	Brooklyn	+0.24	6.05	Port Jervis	0.93	Boonville	Prof. E. A. Fuertes.
North Carolina	+0.5	82	17	Southern Pines	−10	29	Highlands	77	Southern Pines	55	Salisbury	−0.47	9.96	Flat Rock	0.72	Southport	Dr. H. B. Battle.
North Dakota	+8.6	70	*	Napoleon †	−33	27	Woodbridge	95	Napoleon	59	Grafton	−0.08	1.28	Churchs Ferry	T.	Ashley †	B. H. Bronson.
Ohio	+1.3	70	8	Celina	−27	29	Coalton	92	New Waterford	56	Cleveland (v. o)	+0.48	5.99	New Alexandria	1.18	Ridgeville Corners	L. N. Bonham.
Oklahoma	+5.8	85	7	Sac and Fox Agency	− 8	28	Alva †	87	Alva	69	Norman	−1.79	2.72	Purcell	0.10	Fort Reno	J. I. Widmeyer.
Oregon																	
Pennsylvania	−0.4	66	17	Lycippus	−28	29	Wellsboro	86	Wellsboro	47	South Bethlehem	+0.77	5.93	Confluence	2.27	Greenville	W. P. Tatham.
Rhode Island	+1.2	58	15	Pawtucket	5	29	Providence *c*	51	Providence *c*	43	Bristol	+1.50	5.66	Kingston	5.21	Bristol	J. Warren Smith.
South Carolina	0.0	85	2	Trial	− 1	29	Flint Hill	74	Trial †	59	Charleston	−0.86	6.37	Central	0.43	Hardeeville	J. W. Bauer.
South Dakota	+7.7	72	20	Rapid City	−39	26	Ashcroft	95	Ashcroft	69	Vermillion	−0.50	1.04	Aberdeen †	T.	S. W. Glenn.	
Tennessee	−0.5	75	8	Lynnville	−11	29	Bristol	75	Riddleton	61	Ashwood †	+1.01	7.52	Clinton	2.81	Nashville	J. B. Marbury.
Texas	+0.7	97	21	Midland	−10	28	Hartley	83	Midland †	50	El Paso	−1.45	3.95	Sulphur Springs	0.00	Austin †	D. D. Bryan.
Utah	−8.2	65	23	Cisco	−17	5	Koosharem	76	Fort DuChesne	22	Provo City	−0.03	4.10	Soldiers Summit	0.50	Green River	J. H. Smith.
Vermont	+0.7	53	17	Cornwall	−28	30	Woodstock	76	Woodstock	59	Burlington	−0.23	4.52	Irasburg	1.91	Enosburg Falls †	J. Warren Smith.
Virginia		77	2	Callaville	− 9	30	Hot Springs	72	Dale Enterprise †	54	Alexandria		4.87	Big Stone Gap	1.52	Smithville	Dr. E. A. Craighill.
Washington	−3.9	59	21	Walla Walla	− 8	27	Waterville	52	Fort Spokane	16	Tatoosh Island	−1.59	11.98	Neah Bay	0.55	Kennewick	G. N. Salisbury.
West Virginia		80	*	Morgantown	−29	29	Pennsboro	96	Morgantown †	57	Martinsburg		6.56	Beverly	2.31	Harpers Ferry	W. W. Dent.
Wisconsin	+3.5	60	20	Oshkosh	−19	27	Menomonie	71	Menomonie	45	Barron	−0.97	2.47	New Holstein	0.20	Belleville	S. C. Emery.
Wyoming	−1.0	64	15	Fort Laramie	−29	27	Saratoga	82	Fort Laramie	57	Big Horn Ranch	−0.23	1.36	Sundance	0.00	Fort Washakie	E. M. Ravenscraft.

* Two or more days. † At other points in the State.



NOTES.

The Roman letters show number and order of centers of low areas. The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the 8 a. m. and 8 p. m., 75th meridian time, observations.

The queries (?) on the tracks show that the centers could not be satisfactorily located.

Within each circle is given the lowest barometric reading reported near the center. A blank indicates that no reports were available.

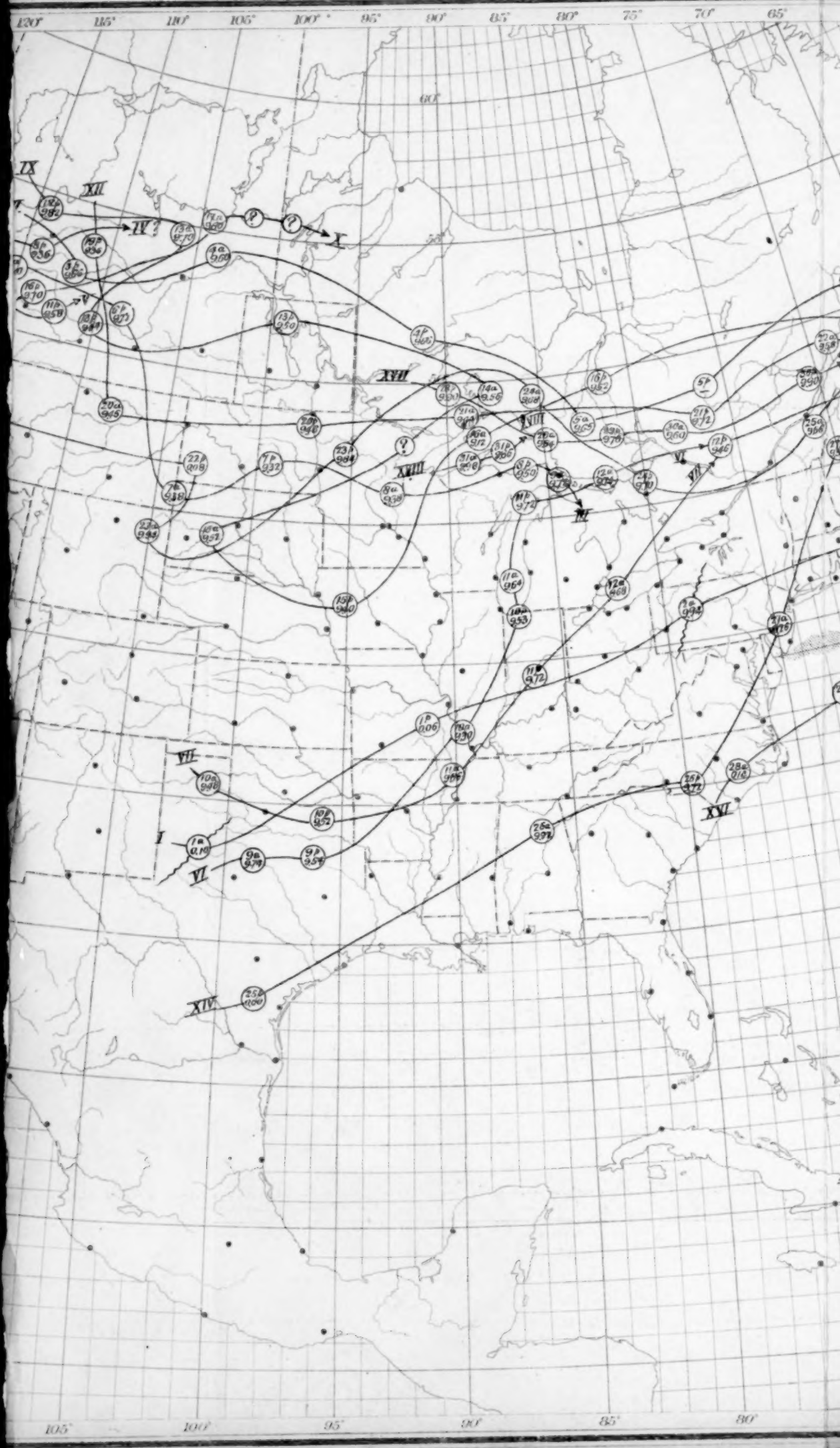
A wavy line indicates the axis of a trough or long oval area of low pressure.

The dotted shading (▒▒▒▒) indicates fog belts.

The crosses (× × × × × ×) indicate the position in which field-ice or icebergs were observed.

UNITED STATES WEATHER BUREAU

Chart I. Tracks of Centers of Low Areas. December, 1894.



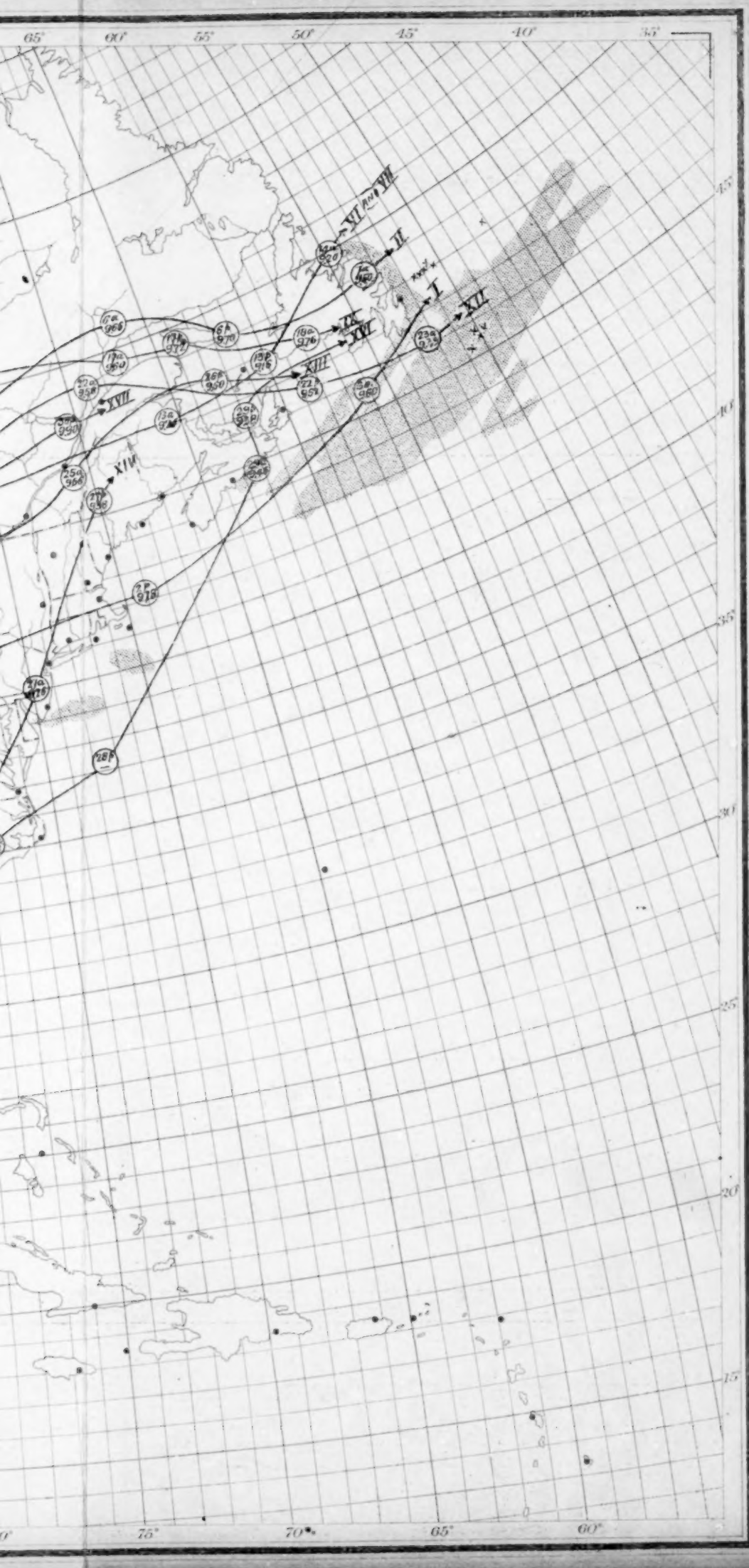

65°
60°
55°
50°
45°
40°
35°
45°
40°
35°
30°
25°
20°
15°
75°
70°
65°
60°
VI AND VII
II
I
XII
XIII
XVII
XIV
28 P

Chart II. Isobars, Isotherms, and Resultant Winds. December, 1894.

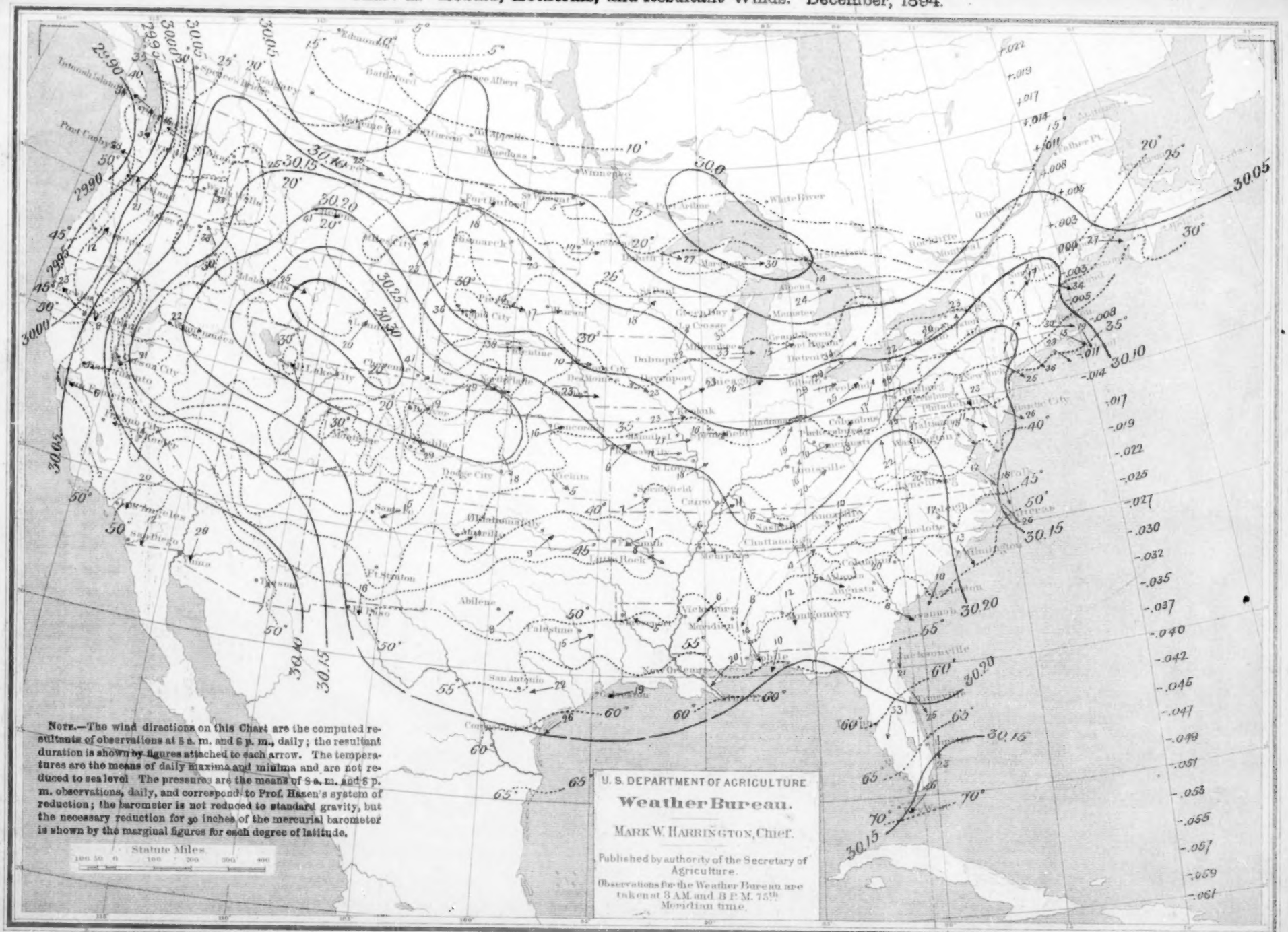

Note.—The wind directions on this Chart are the computed resultants of observations at 8 a. m. and 8 p. m., daily; the resultant duration is shown by figures attached to each arrow. The temperatures are the means of daily maxima and minima and are not reduced to sea level. The pressures are the means of 8 a. m. and 8 p. m. observations, daily, and correspond to Prof. Hazen's system of reduction; the barometer is not reduced to standard gravity, but the necessary reduction for 30 inches of the mercurial barometer is shown by the marginal figures for each degree of latitude.
Statute Miles
100 50 0 100 200 300 400
U. S. DEPARTMENT OF AGRICULTURE
Weather Bureau.
MARK W. HARRINGTON, Chief.
Published by authority of the Secretary of Agriculture.
Observations for the Weather Bureau are taken at 8 A.M. and 8 P.M. 75th Meridian time.

Chart III. Total Precipitation. December, 1894.

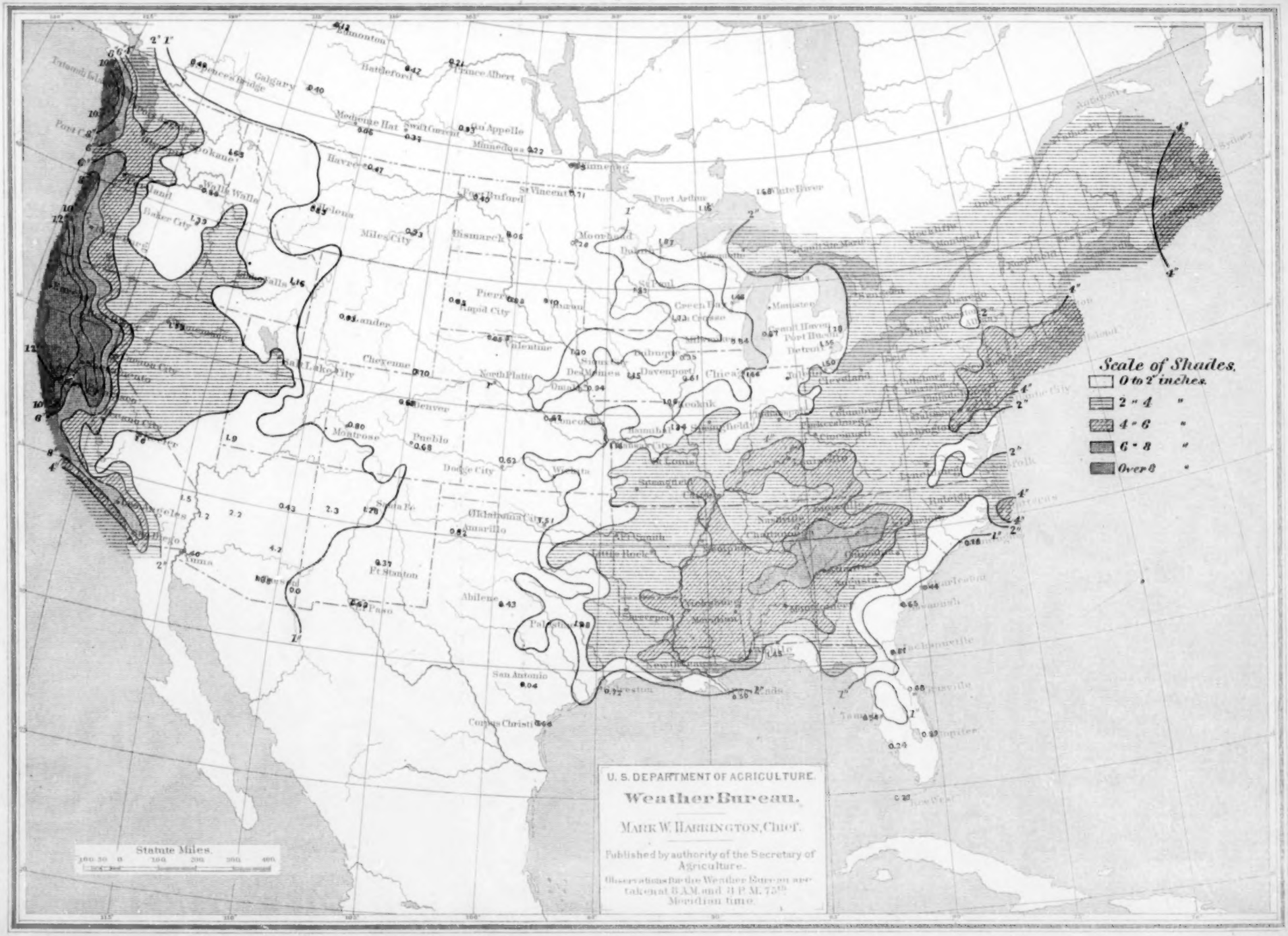

Scale of Shades.
0 to 2 inches.
2 - 4 "
4 - 6 "
6 - 8 "
Over 8 "
Statute Miles.
U. S. DEPARTMENT OF AGRICULTURE.
Weather Bureau.
MARK W. HARRINGTON, Chief.
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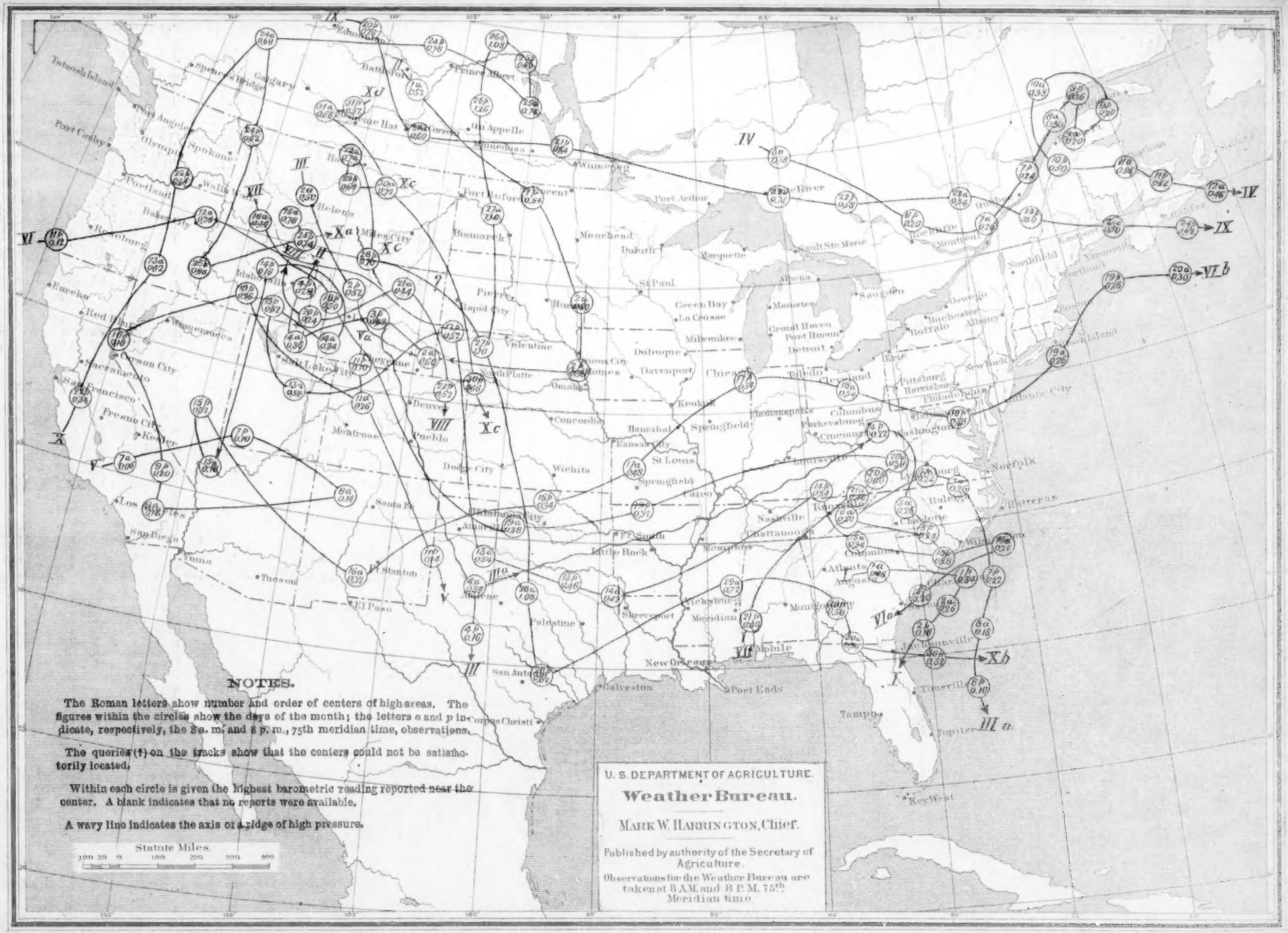
Chart IV. Tracks of Centers of High Areas. December, 1894.

Chart IV. Tracks of Centers of High Areas. December, 1894.


NOTES.
The Roman letters show number and order of centers of high areas. The figures within the circles show the days of the month; the letters a and p indicate, respectively, the 8 a. m. and 8 p. m., 75th meridian time, observations.
The queries (?) on the tracks show that the centers could not be satisfactorily located.
Within each circle is given the highest barometric reading reported near the center. A blank indicates that no reports were available.
A wavy line indicates the axis of a ridge of high pressure.
Statute Miles.
100 50 0 100 200 300 400
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Weather Bureau.
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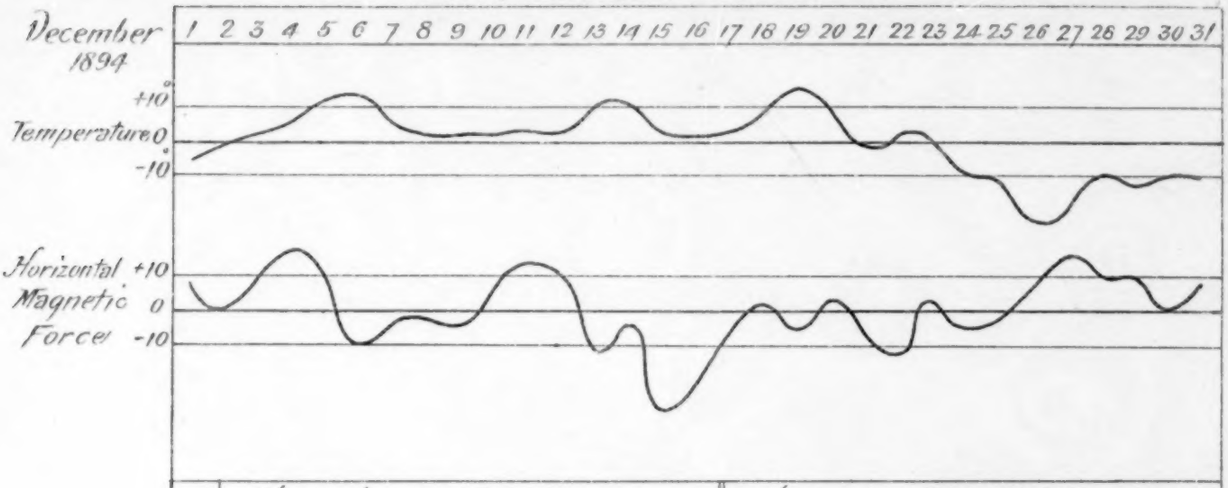
Chart V. Relative Variations of the Northwest Temperatures and the Horizontal Magnetic Force of Toronto, Washington, and San Antonio.



	North West Temperatures.							Horizontal Magnetic Force.						
				Variations.							Variations.			
December	Calgary	Williston	Sioux City	Calgary	Williston	Sioux City	Means-1	Toronto	Washington	San Antonio	Toronto	Washington	San Antonio	Means-2
1	8	20	27	-6	+1	-17	-5	435.8	57.9	295.2	+9	+15	+3	+7
2	15	22	28	+1	+3	-11	-1	435.3	56.5	294.0	+4	+1	0	0
3	15	25	34	+1	+6	-5	+2	435.9	58.0	298.6	+10	+16	+8	+9
4	21	28	38	+7	+9	-1	+6	436.4	58.8	303.5	+15	+24	+17	+17
5	24	34	47	+10	+15	+8	+12	435.5	57.4	299.7	+6	+10	+8	+6
6	26	29	52	+12	+10	+13	+13	434.6	55.5	290.6	-3	-9	-11	-10
7	18	27	39	+4	+8	0	+5	435.6	56.7	291.9	+7	+3	-9	-2
8	17	22	37	+3	+3	-2	+2	434.9	57.2	291.3	0	+8	-11	-3
9	14	26	36	0	+7	-3	+2	435.2	56.8	290.4	+3	+4	-14	-4
10	15	25	34	+1	+6	-5	+2	436.0	58.3	294.6	+11	+19	-7	+6
11	19	24	34	+5	+5	-5	+3	436.9	58.8	297.2	+20	+24	-3	+12
12	19	25	35	+5	+6	-4	+3	436.0	58.4	299.2	+11	+20	0	+8
13	28	30	40	+14	+11	+1	+10	433.6	56.3	295.5	-13	-11	-8	-13
14	25	33	47	+11	+14	+8	+12	435.4	55.7	297.8	+5	-7	-4	-4
15	22	21	36	+8	+2	-3	+3	432.4	52.6	290.2	-25	-38	-20	-30
16	15	23	36	+1	+4	-3	+2	433.5	54.4	290.8	-14	-20	-20	-20
17	13	28	38	-1	+9	-1	+3	434.6	56.9	294.7	-3	+5	-13	-6
18	20	34	41	+6	+15	+2	+9	435.8	57.6	295.2	+9	+12	-13	+1
19	27	41	49	+13	+22	+10	+16	435.8	56.7	290.4	+9	+3	-24	-6
20	21	27	46	+7	+8	+7	+8	436.6	58.3	294.3	+17	+19	-17	+4
21	9	23	34	-5	+4	-5	-1	435.5	57.4	289.8	+6	+10	-27	-6
22	6	26	41	-8	+7	+2	+1	434.6	56.9	286.4	-3	+5	-35	-13
23	13	18	36	-1	-1	-3	-1	438.4	57.6	288.1	+35	+12	-33	+3
24	6	7	25	-8	-12	-14	-10	435.6	57.7	291.1	+7	+13	-28	-5
25	9	2	25	-5	-17	-14	-11	435.8	58.2	292.7	+9	+18	-26	-2
26	2	-6	1	-12	-25	-38	-24	436.6	58.4	304.6	+17	+20	-3	+9
27	-4	7	9	-18	-12	-30	-19	437.1	59.0	309.6	+22	+26	+6	+16
28	11	9	18	-3	-10	-21	-10	435.7	58.4	310.5	+8	+20	+7	+10
29	5	10	17	-9	-9	-22	-12	436.0	58.5	309.7	+11	+21	+4	+10
30	10	11	19	-4	-8	-20	-10	436.2	57.6	300.4	+13	+12	-16	+1
31	6	10	22	8	-9	-17	-10	436.6	58.4	306.8	+17	+20	-4	+9

Chart VI.—Depth of Snowfall (inches) and Limits of Freezing Weather.—December, 1894.

Chart VI. Depth of Snowfall (inches) and Limits of Freezing Weather. December, 1894.

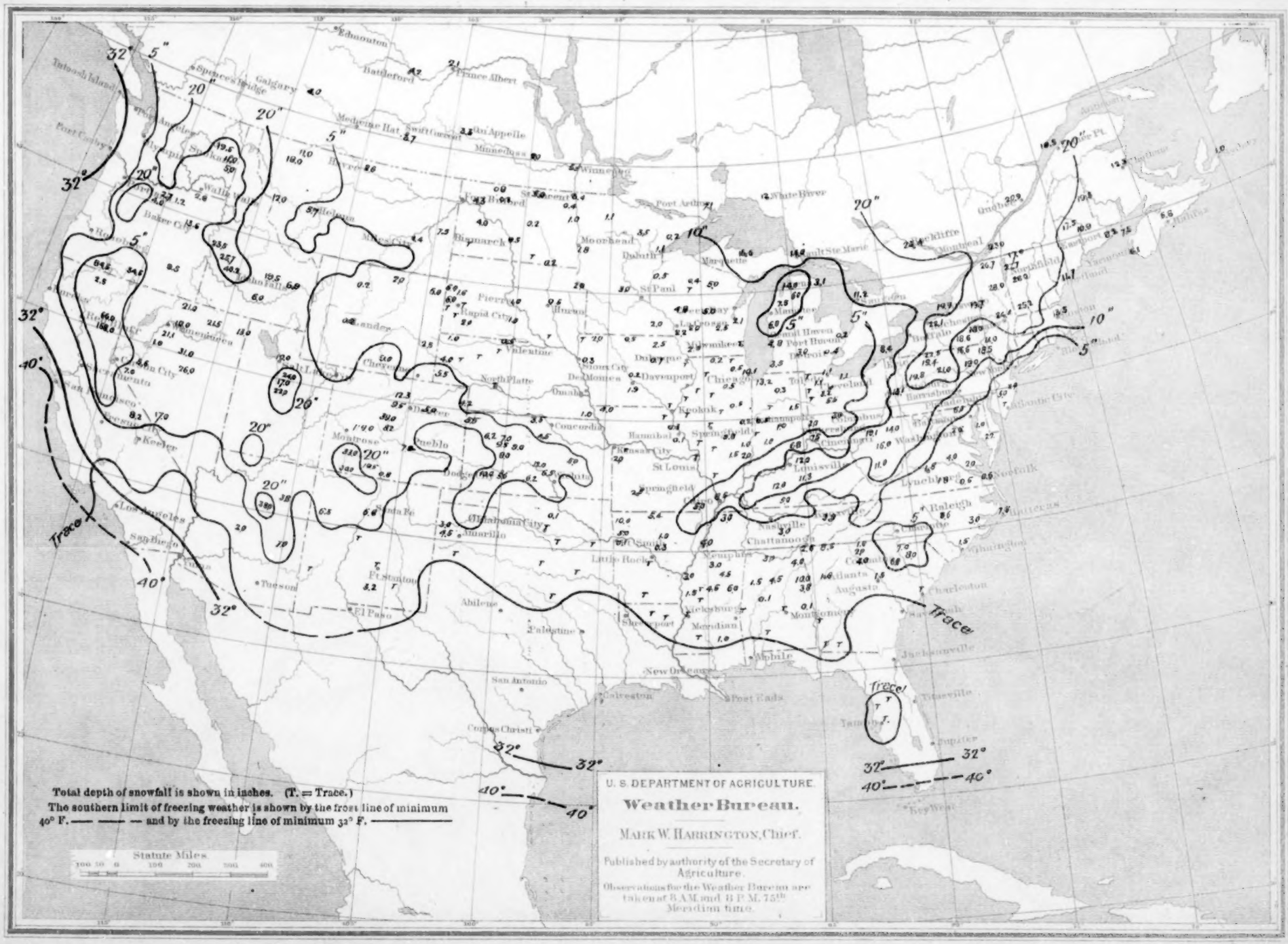

Total depth of snowfall is shown in inches. (T. = Trace.)
The southern limit of freezing weather is shown by the frost line of minimum 40° F. — — — and by the freezing line of minimum 32° F. ———
Statute Miles
100 50 0 100 200 300 400
U. S. DEPARTMENT OF AGRICULTURE.
Weather Bureau.
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Chart VII. Depth of Snow lying on ground December 31, 1894.

Total depth of snow on ground is shown in inches. (T. = Trace.)
Statute Miles.
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Weather Bureau.
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